The Communicator

July—August 2023

SARC

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Our article reprint policy is on page 113

Issues appear bi-monthly, on odd-numbered months, for area Amateur Radio operators and beyond, to enhance the exchange of information and to promote ham radio activity.

Contributions of articles and photos are welcome.

During non-publication months we encourage you to visit the Digital Communicator at **ve7sar.blogspot.ca**, which includes recent news, past issues of ***The Communicator***, our history, photos, videos and other information.

To subscribe, unsubscribe or change your address for e-mail delivery of this electronic journal, notify **communicator @ ve7sar.net**

If you find ***The Communicator*** worthwhile, regular readers who are not SARC members are invited to contribute a $5 annual donation towards our Field Day fund via PayPal.

SARC maintains a website at **www.ve7sar.net**

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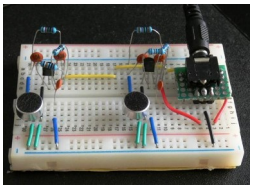

Daniel Romila is back with several projects and information on a variety of electronics components useful to the ham.

Larry VE7LXB reports on our excellent Field Day results and progress on several of our new ham initiatives.

This issue, Kevin VE7ZD rambles about our hobby in… Communicator or Technologist?

…and so much more!

QRM -- --.-- .--. --

...from the Editor's Shack

Do you have a photo or bit of Ham news to share? An Interesting link?

Something to sell or something you are looking for?
eMail it to communicator at ve7sar.net for inclusion in this publication.

Field Day is behind us and that pretty much indicates that another ham year is drawing to a close. Our summer general meeting dates are social gatherings instead, outdoors if the weather permits. Members and non-members are invited 7-9PM, Wednesday, July 12 and August 9.

Our GOTA efforts have paid off in a big way! The 'unseasoned hams' made a total of 404 contacts between them and that is exponentially better than any previous effort by SARC/SEPAR. We owe a big thanks to Larry VE7LXB and the other SARC and SEPAR members who made this happen. Check out Larry's column in this issue for the story of how this came about and why it was so successful.

We suffered a major loss of content on our Google Drive recently. The loss was confined to larger files, mostly past Communicators. The impact is that posted links to past Communicators no longer work. I am trying to set-up new links , but in the meantime I have set sharing links to our Google Drive directories for each Communicator year.

Next issue look for an article about our recently completed low-cost Az-El satellite tracker. It is a project from Australia that can be built with an average to advanced skillset using off-the-shelf parts. We ran it on Field Day interfaced with our iCom 9700, a laptop and the free gPredict software and it reliably tracked the sats.

73,

~ John VE7TI, Editor
communicator@ve7sar.net

This Month's Cover...

Our 110-ft tower at Field Day. There is much to celebrate from Field Day this year, and you will read that our GOTA station was the hero.

"If everyone is moving forward together,
then success takes care of itself" - *Henry Ford*

On the Web

ve7sar.net

Between Communicators, watch your e-mail for news, announcements of Amateur Radio events, monthly meetings and training opportunities.

Click the links below to follow our presence on the web and social media:

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or

tinyurl.com/SARCphoto

The Rest Of The Story…

The man who first heard the Titanic distress call

Artie Moore

Arthur Moore (1887 – 20 January 1949) was a Welsh wireless pioneer who heard the distress signal from RMS Titanic on his home-made equipment before news of the disaster reached Britain. He subsequently worked for the Marconi Company, helping to develop radio and sonar.

Arthur Moore was born in Pontllanfraith, near Blackwood, where his father owned Gelligroes Mill. At a young age Moore was involved in an accident at the mill which resulted in the loss of the lower part of one of his legs. For the rest of his life, he wore a wooden leg. By the age of ten, Moore had developed an interest in amateur engineering and he adapted a bicycle to cater for his wooden leg.

At some point prior to 1909, most likely in his early teenage years, using a hand-made lathe driven by the water-wheel at the mill, Moore built a working model of a horizontal steam engine. The model won a competition in The Model Engineer magazine; the prize, a book by Sir Oliver Lodge entitled Modern Views of Magnetism And Electricity, awakened his interest in wireless.

After Moore and his brother took over operation of the mill from their father, they used a generator coupled to the mill wheel to charge batteries to provide electrical power for local farmers, who were not yet connected to the mains supply; they also created machinery for them.

Home-made wireless station

In a garden shed and later in the loft of the mill, Moore built a rudimentary radio station consisting of a coherer-based receiver and a spark-gap transmitter, also powered by batteries charged from the mill wheel. Amateur radio enthusiast Billy Crofts told the BBC: “He strung up all these aerials made from thin strands of copper wire from the Gelligroes mill, over the nearby River Sirhowy and slung between trees up the hillside to an old barn to create a large aerial system that enabled him to receive distant signals.”

Using his homemade aerials, Moore was able to pick up radio messages from further away then anyone had previously thought possible, and in 1911, he intercepted the Italian government's declaration of war on Libya and was featured on the front page of the London newspaper The Daily Sketch.

Using the spark-gap transmitter technology of the time, Moore together with his friend Richard Jenkins, an electrical engineer at the local coal mine, made what was probably the first use in Wales of amateur wireless for business purposes. Having set up a second transmitting and receiving station at Ty Llwyd farm, owned by Jenkins's father which was located approximately three and a half miles south of Gelligroes at Ynysddu, Moore received an order over the air for grain to be delivered from the mill to the farm.

RMS Titanic

Early on 15 April 1912, over a distance of more than 3,000 miles (4,800 km), Moore heard the distress signal in Morse Code from Titanic, one of the first uses of "SOS". He bicycled to the police station in Caerphilly, where his report was discounted, and they are said to have mocked him and told him to go back to bed.

With no other ship nearby in the wide expanse of the freezing North Atlantic, more than 1,500 passengers and crew lost their lives before survivors were rescued by cruise ship the Carpathia, two hours after the sinking. Although the distress call did not prevent the immense loss of life, two days later, press reports confirmed the accuracy of his report, including that the ship's wireless operator had used "SOS" in addition to the older "CQD" code for a ship in distress.

Wireless career

In summer 1912, the publicity surrounding Moore's hearing the Titanic's distress signal led the then Monmouthshire Education Committee to offer him a scholarship to the British School of Telegraphy in London. After three months of study, he was advised by the principal there to enter for a Government examination in Wireless Telegraphy and Morse Code, in which he was successful.

Guglielmo Marconi, the wireless pioneer, had predicted a range of above 2,000 miles (3,200 km) for wireless reception, which Moore had greatly exceeded. After a local resident wrote to him concerning Moore, Marconi visited him and offered him a position as a draughtsman at the Marconi Company. Appointed in 1914 to the Ship Equipment Department, he worked for Marconi's companies for the rest of his career.

The one-legged Welshman went to police but was not believed after he recorded calls from stricken 'unsinkable' ship in 1912.

Moore at his Ham shack (literally!)

During the First World War, Moore became a technician in "special Admiralty fittings", working on the clandestinely armed Q-ships and designing and supervising the installation of wireless equipment on the Dreadnought-class battleships HMS Invincible and HMS Inflexible to enable them to communicate with Britain on their mission to the Falkland Islands. He later became assistant to Captain H.J. Round and worked with him on the further development of the thermionic valve.

At war's end, he was transferred to Liverpool, where he headed the newly formed Ship Equipment Department. In 1923, he was transferred to the Marconi International Marine Communication Company and appointed manager at Avonmouth, where he remained until his retirement in 1947. In 1922, he patented an early form of sonar; during the Second World War, his sonar work was instrumental in helping Allied ships avoid German U-Boats in the North Atlantic.

Soon after his retirement, Moore developed leukemia; he moved to Jamaica to recuperate, but six months later returned to England, where he died in a convalescent home in Bristol on 20 January 1949.

Legacy

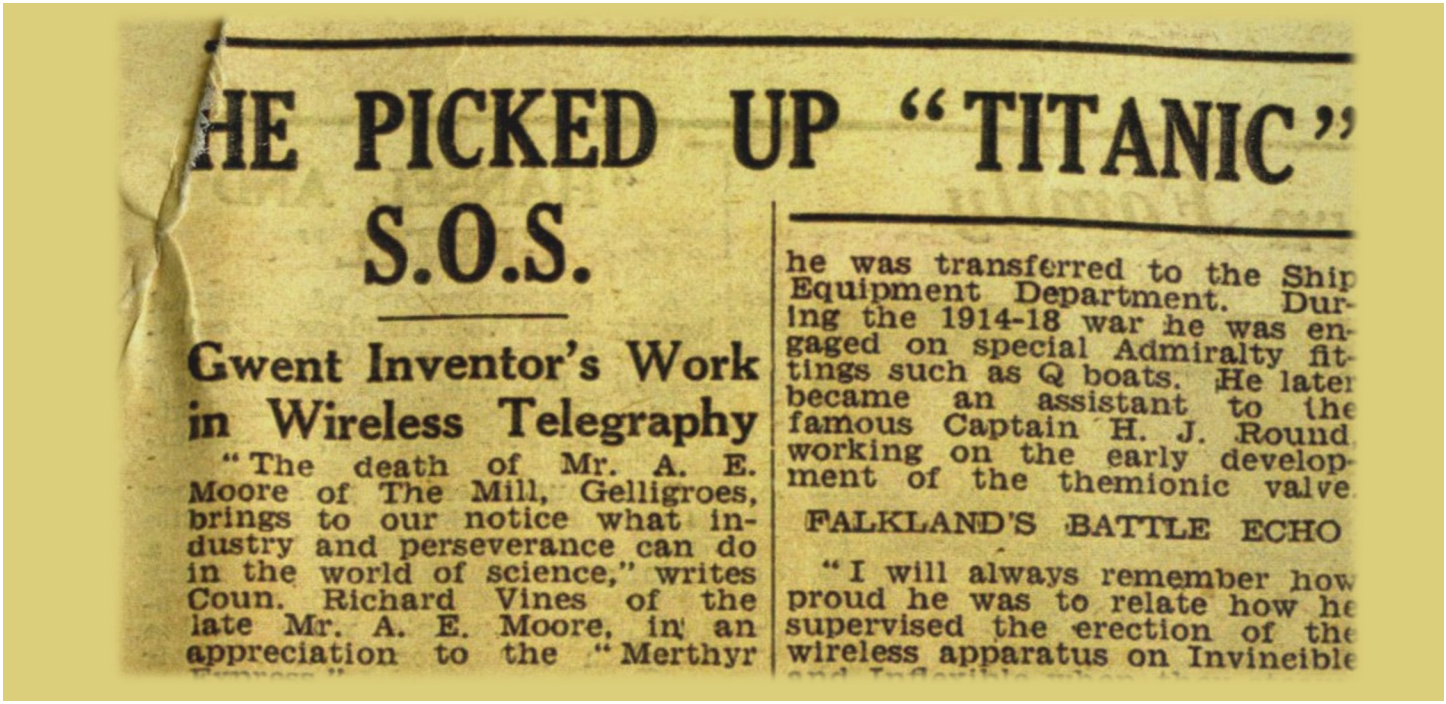
Fittingly, it was the sonar technology he pioneered that was used to find the Titanic's wreck in 1985.

Moore inspired local wireless enthusiasts to create in 1927 the Blackwood Transmitters Club, later the Blackwood Amateur Radio Society.

The Artie Moore Amateur Radio and Historical Preservation Society are creating an Artie Moore archive and periodically transmit from Gelligroes Mill with the amateur radio callsign MW0MNX, based on Moore's MNX.

And that is his story.

~ With thanks to Laura VE7LPM



HE PICKED UP "TITANIC" S.O.S.

Gwent Inventor's Work in Wireless Telegraphy

"The death of Mr. A. E. Moore of The Mill, Gelligroes, brings to our notice what industry and perseverance can do in the world of science," writes Coun. Richard Vines of the late Mr. A. E. Moore, in an appreciation to the "Merthyr

he was transferred to the Ship Equipment Department. During the 1914-18 war he was engaged on special Admiralty fittings such as Q boats. He later became an assistant to the famous Captain H. J. Round working on the early development of the themionic valve.

FALKLAND'S BATTLE ECHO

"I will always remember how proud he was to relate how he supervised the erection of the wireless apparatus on Invincible

The Titanic

Constructed by Belfast-based shipbuilders Harland and Wolff between 1909 and 1912, the RMS Titanic was the largest ship of her time and was designed in such a way that it was meant to be 'unsinkable'.

It had an on-board gym, libraries, swimming pool and several restaurants and luxury first-class cabins.

There were not enough lifeboats on board for all the passengers due to out-of-date maritime safety regulations.

After leaving Southampton on April 10, 1912, Titanic called at Cherbourg in France and Queenstown in Ireland before heading to New York.

On April 14, 1912, four days into the crossing, she hit an iceberg at 11:40pm local time.

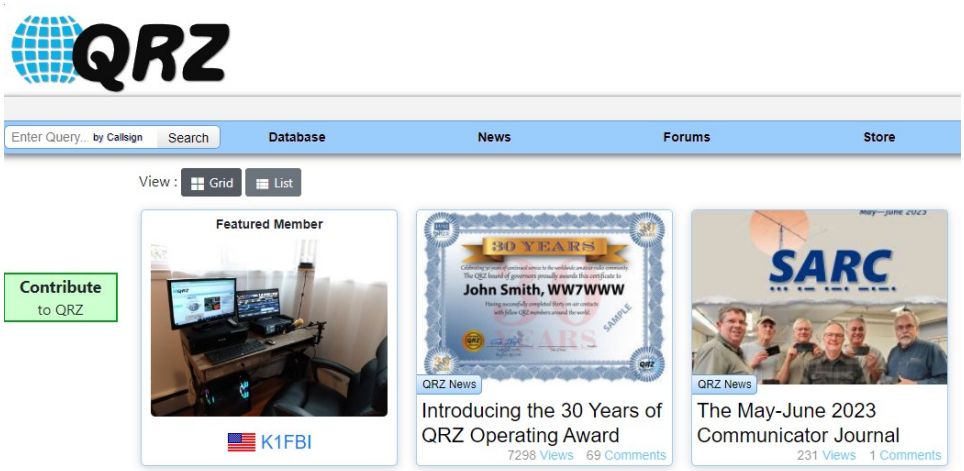
James Moody was on night watch when the collision happened and took the call from the watchman, asking him: 'What do you see?' The man responded: 'Iceberg, dead ahead.'

By 2.20am, with hundreds of people still on board, the ship plunged beneath the waves, taking many, including Moody, with it.

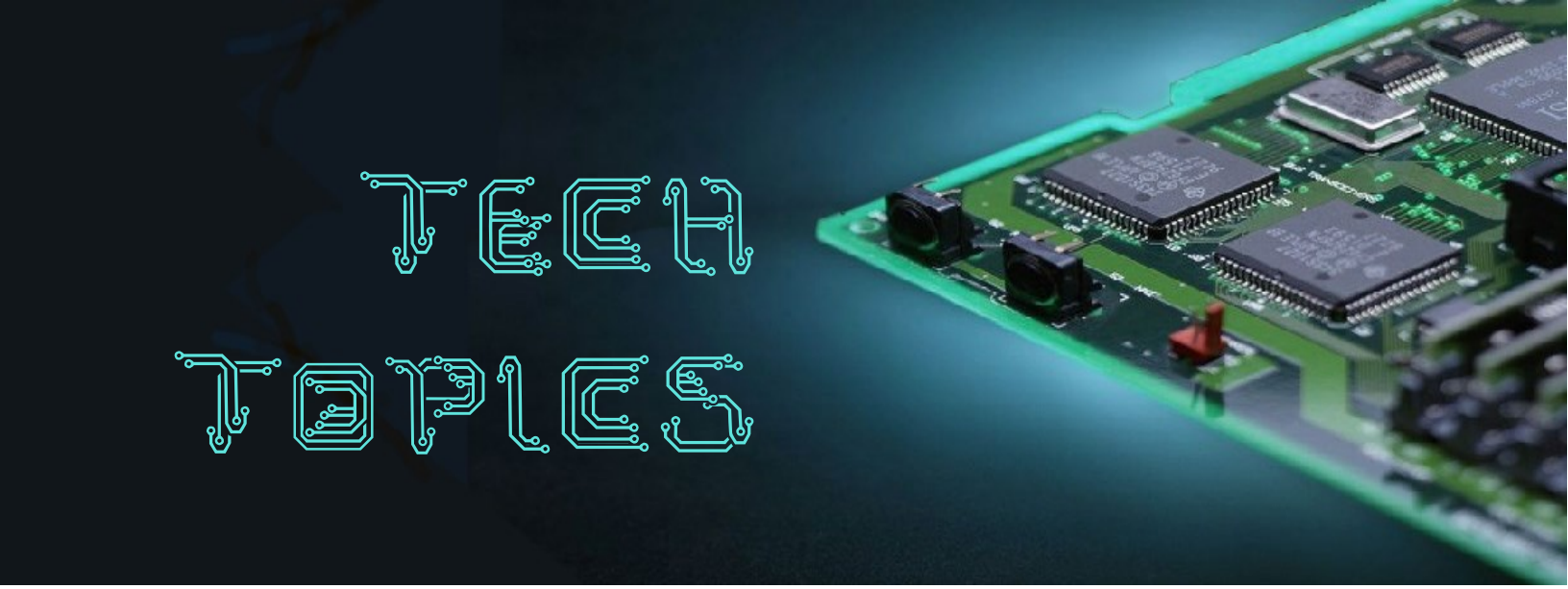
Despite repeated distress calls being sent out and flares launched from the decks, the first rescue ship, the RMS Carpathia, arrived nearly two hours later, pulling more than 700 people from the water.

It was not until 1985 that the wreck of the ship was discovered in two pieces on the ocean floor.

Are you curious what the luxury liner looked like? Check out '[Walking the Titanic']' in 4K on YouTube.



Listed again on QRZ!



Converting a traditional UPS to use lithium iron phosphate batteries

By HALDEN FIELD VE7UTS

Halden Field VE7UTS is a frequent contributor to the weekly newsletter of the North Shore Amateur Radio Club (NSARC Contact)

Some hams use an Uninterruptible Power Supply (UPS) to operate critical appliances when the grid power fails. Although I'd be wary of operating an expensive radio from an inexpensive UPS, accessory appliances such as computers and lights should probably survive such operation and help with station operational efficiency during a power outage. Most old UPSs I've seen were designed to use lead-acid batteries (sometimes marketed as "SLA" and "AGM"). After that, batteries using Lithium Iron Phosphate (LiFePO4, LFP) chemistry reached the market, offering longer cycle life, good efficiency, dramatically lower mass, and less sensitivity to depth of discharge. They're also affordable when shipped to an address in USA. When a UPS's lead-acid battery needs replacing, hams may consider replacing the whole UPS with one that uses a modern battery and electronics. But installing a LiFePO4 battery into an old UPS instead can save money and landfill space.

This article considers, as an example, converting an APC model 350 ES (model BE350U per the label) UPS to run on a LiFePO4 battery instead of the lead-acid battery that came with the unit. Doing this extends the operation period of the UPS and removes the need for periodic battery replacement, but reduces the amount of load that the UPS can supply when AC power is not available. Extending the operation

period requires a simple modification to the internal circuit. One can avoid the load limitation by connecting a higher-capacity LiFePO4 battery (which would not fit inside the UPS's battery enclosure). For those considering running a UPS meant for a lead-acid backup battery on LiFePO4 battery instead, here are some details that might help.

Modifications

As originally built, this UPS is able to charge its backup battery to 13.4 V. This is enough to only partially charge an LiFePO4 battery. Those not needing to use the full capacity of their LiFePO4 battery can simply connect the battery and use the UPS without modification. But be aware of the load limitations described below, under "Load Management".

This UPS's internal circuit includes a computer, a charger, and an inverter (converts ~12VDC to ~113 VAC). The charger section uses a TL780-15 voltage regulator followed by 2 diodes to drop the voltage. I simply shorted one of those diodes out which brought the maximum charge voltage to 14.3 V which is perfect for 4-cell LiFePO4 batteries.

This UPS's battery compartment contained a grid of thin plastic fins that enabled a 3.5 Ah lead-acid battery to fit without flopping around in the larger enclosure. I used a knife and heavy pliers to cut and break away those fins, enlarging the usable space to hold a 151*65*94mm 12V 6Ah LiFePO4 battery. I also have an 8Ah battery that fits.

Performance

One performance metric is how long a UPS will power its loads when the grid power fails. This is the only aspect of performance that I expect to change with this modification. The manufacturer specifies the runtime as 36 VAh. This is actually a property of its original battery: 12 V, 3 Ah. The UPS's maximum load specification is 200W or 350 VA. I found a calculator on the APC website for this product that says the runtime is 24 minutes for 48W, 12 minutes for 85 W, and 2 minutes for 200W. 36VAh would be equivalent to 45 minutes on the 48-watt incandescent light bulb used in my test and double the website calculator's result.

Battery Backup plus Surge Protection
APC
www.apc.com
Back-UPS ES
350
Surge Protection
Power On
APC
Brand: Enjoybot
Product Name: LiFePO4 Battery
Model: LAF1206
Manufacturer: Shenzhen Enjoybot Technology Co., Ltd
Address: Room 1206-07, Allian Building, No. 2002, Longgang Avenue, Xinlian Community, Longcheng Street, Longgang District, Shenzhen, Guangdong, China 518172
Telephone: +8618576640617
Official Website: https://www.enjoybotbattery.com
Certification: UL, CE, RoHs, PSE, SDS, WEEE, etc.
Customer Service Email: us-amazon@enjoybotbattery.com
NOTE: Before using the product, please read the product manual and warranty terms carefully.

I installed an almost-fully charged 6Ah (measured ~5.5Ah) LiFePO4 battery in the unit and let it charge overnight. The charge rate is 200-250 mA which would not have been enough had the battery been fully discharged. The next day, the Rona 60W 130V lamp drew 53W on electricity from the grid and 48 W from the UPS running from its battery. The UPS provided 113 VAC to the lamp for 67 minutes. After accounting for the higher capacity battery (6Ah instead of 3 Ah), this is 1.4 times the APC website calculator result.

Load [W]	Voltage [V]	Current [A]	Input Pwr [W]	Efficiency
94	11.5	10.2	117	80
94	12.2	9.8	120	79
48	12.0	5.4	65	74
48	12.6	5.1	64	75

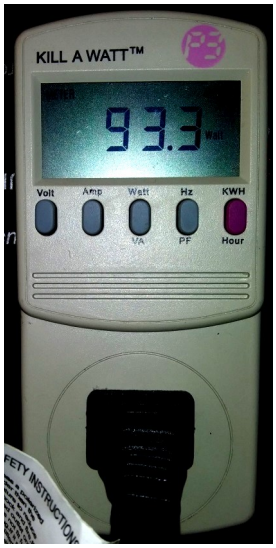
I made some additional measurements to help assess this UPS' performance using 2 batteries and 2 light bulbs *[see the table on the previous page]*.

Current readings used visual averaging because the meter's current display was not stable. The no-load current draw is 0.4 A. To check for consistency, I estimated the average current draw to be 5.25A. 67 minutes of operation means the battery's capacity at approximately 1C discharge rate was 5.9 Ah. That's consistent with the battery manufacturer's 6Ah claim.

Load Management

This UPS claims to be able to power loads up to 350 VA or 200W. With a 200W resistive load and 80% efficiency, such a load would draw 20.8 A from a 12.0V battery. The current draw would increase as discharge progresses. A small lead-acid battery might be able to tolerate such a draw for several minutes, but a 6Ah LiFePO4 battery can sustain such discharge for several seconds at most. The manufacturer of the LiFePO4 battery I installed in my UPS specifies the maximum continuous discharge current to be 10A. That means my modified UPS can supply only half the load it claims to support based on using a lead-acid battery. One can still supply the same load that a lead-acid battery supports by using a larger capacity LiFePO4 battery, but it won't fit in the UPS's case. A side benefit is much longer runtime.

Instrumentation



I used a cheap handheld DMM, connected at the UPS's battery leads, for voltage measurements. A "Kill-A-Watt" power meter plugged into the UPS's outlets provided AC voltage and power readings. An inexpensive, unbranded, blue DC power meter purchased on ebay provided DC current readings.

Comments and questions welcome. Please do not copy and distribute this article without contacting me first.

~ Halden Field VE7UTS

SARC Trello site

What is Trello? According to their website, Trello is the visual tool that empowers a team to manage any type of project, workflow, or task tracking.

We recently launched a Trello site managed by Reg VA7ZEB to receive ideas and to permit our members to see some of the issues and ideas that we are discussing.

You can visit the site at: ve7sar.net/brainstorm

Hardware

SWR meters

A look at what is available

by REG NATARAJAN VA7ZEB

I am on an SWR meter binge. I want them everywhere. I also prefer digital to analog, mainly because I dislike having to do the calibration most analog meters require.

I found this MFJ on Radioworld for C$360 https://www.radioworld.ca/mfj-849. It does exactly what I need it to do, and I have noticed it being used by just about every ham radio Youtuber out there, so it made my short list. Call it $420 after taxes and shipping.

Then I found the exact same meter with the Nissei brand name on AliExpress for $210 shipped to my door. Literally half price. It had excellent feedback from US/Canada buyers.

I ordered it, received it in three weeks, and love it. It's perfect. It does exactly what I want an SWR meter to do. It is not some cheap knockoff. It is almost certainly the exact same meter as the MFJ made in exactly the same factory with a different name slapped on it. And it's not like MFJ has such a great reputation anyway, but that's another discussion.

My point is this: yes, I want to support Canadian businesses like Radioworld and GPS Central. Yes, I value the warranty that comes with buying from Radioworld or GPS Central. No, I don't want to support the repressive regime in China. I will pay extra for all of those things, but a 100% markup? No thanks. The price differential is just becoming absurd, and is way beyond my tolerance levels.

We have very few local ham radio stores in BC and none of them stock items like this. The choice is between clicking on Radioworld and waiting a few weeks or clicking on AliExpress and waiting a few weeks. Others can make their own choices, but I'm finding myself doing the latter more and more, lately.

~ Reg VA7ZEB

News You Can't Lose

See you in New Westminster, BC this August!

by REBECCA KIMOTO VA7BEC

The Orca DX and Contest Club (Orca DXCC) was established in Fall 2010 to serve as a community open to all amateur radio operators in BC or the BC-Washington border region with an interest in DXing and contesting.

I'd like to share some exciting news with you and your club members. The PNW DX Convention is coming back to the Vancouver area in August. It's a traveling event, with hosting duties shared among DX/contesting clubs in the Pacific Northwest. This year — 2023 — will mark the 68th running, and Orca DX and Contesting Club is the host.

The PNW Convention is always a fantastic opportunity to have some eyeball contacts with people you may only know by voice or dits-and-dahs. It's also a chance to learn about all sorts of radio-related stuff, with presentations on various topics, not just DX and contesting.

The theme this year is "To boldly go..." - not Star Trek boldly but DX boldly - as in the intrepid Dxpeditioners who go to great lengths time- and money-wise as well as great distances - literally to the ends of the earth - to put DX entities on the air. One of the presentations will indeed be on this theme: the 3Y0J DXpedition to Bouvet Island earlier this year.

Summer is always a busy time, so it's better to put the convention on your calendars sooner than later. The cost of the weekend event is very reasonable and includes a Friday early-evening gathering on the patio, a great dinner and evening presentation on Saturday, a lovely breakfast buffet on Sunday and, of course, interesting presentations.

The convention website http://pacificnwdxconvention.com has event details. Use this site to register and to get accommodation info as well.

Note that if you go to the hotel's website to make a reservation, you might see that there aren't any rooms available. But that's because a big block of rooms has been set aside for people attending the convention. Give the hotel an old-fashioned phone call - at 604-520-5645 or toll free at 1-800-663-2001- and mention that you're attendiang the PNW DX Convention.

Oh, I can't forget to mention the prizes that will be available. The headlining grand prize this year is an IC-7300.

If anyone has questions, email me. If I don't know the answer, I'll find someone who does.

~ Rebecca VA7BEC

Page 13—News You Can Lose

The Lighter Side of Amateur Radio

Local club accidentally invites people to Field Day

MADISON, TEXAS – A southern Texas amateur radio club is scrambling to figure out how to keep people away from their Field Day activities after a newspaper published details about their event.

"We just wanted the bonus points, not visitors," said Nathan Binn.

"I sent an email to our small-town weekly newspaper expecting them to ignore it like they do every year. Instead, they published the date and time of our event, our hotel room number, my cell phone and my email address," he said.

Binn became concerned after receiving a phone call from the proprietor of the Best Western Inn.

The hotel manager, Louis Downington, told Ham Hijinks, "When the room was booked I was under the impression that it was just five guys fooling around with ham radio. But then I read in the newspaper it was an 'event' at my hotel and wasn't happy at all."

"This year, we decided to set up at the hotel with our gear and portable antennas to enjoy indoor amenities like air conditioning and a vending machine while operating," said Binn.

But the radio club actually doesn't want visitors. "We're not very sociable people," said Binn. "And our food plans do not include enough rations for more than our group."

"We are grateful for the bonus points, but I don't know what we'll do if someone shows up," he said.

~K5KVN, on the scene

Radio Ramblings

Communicator or Technologist?

Kevin VE7ZD/KN7Q is active in EME, meteor scatter and much more. He lives on Vancouver Island

By KEVIN McQUIGGIN VE7ZD / KN7Q

Last issue I wrote about the role of experimentation in amateur radio, and the impressive historical record of innovation within our hobby. This issue I'd like to bring the overarching idea of innovation down to earth and explore two quite different personal perspectives on our hobby: that of the "communicator", and that of the "technologist".

Chances are that one perspective or the other was behind your own motivation to get involved in amateur radio. Are you a communicator, or a technologist?

Technologists

Some hams are hooked on radio science: the "magic" of radio. They have questions: what are radio waves and how do they propagate? Why do signals radiate in the first place? How does a transmitter work, and why can antennas pull these unimaginably weak signals out of the aether? How can I make radio systems work better? Why are software-based radios so much more sensitive and selective?

Figure 1 above – The Magic of Radio, QST March 1923

To technologists, ham radio is "all about the journey" rather than the destination. Their central interest is in the technology itself and the process through which the technology is assembled, designed, or constructed in order to meet a communicative goal of some sort. The fun is in the "solving of the problem", not in the use of the system after the solution has been put in place.

A technologist ham may spend (for example) several months designing a station to be able to operate on a new mode, then refine his design over the next year to make it more robust. He will make some QSOs using the new equipment to test the solution and ensure that it works, but will then typically move on to another project. To the technologist, a problem has been solved and he will look for another interesting challenge.

Technologists also often eschew purchase of commercial amateur equipment in favour of building their own gear, because part of their interest in the problem is in learning how to solve it themselves.

If this describes your view of radio (and maybe also the reason you became involved in amateur radio, to explore these questions), then you have a technological perspective of our hobby.

Communicators

The other group of hams are less interested in radio science and the "nuts and bolts" of how radio works than in the question of how radio can be used to communicate. They may be described as "applied technologists". The communicator ham uses amateur radio to advance social goals such coordination of community events, management of emergencies or disasters, or to conduct emergency preparedness exercises.

Communicators are focused on the communicative capability of radio, and consequently its ability to help others, build relationships, and solve problems. To communicators, this is the most fascinating aspect of the technology: you can use radio to forge friendships, bring aid to those in trouble, educate children in remote communities, respond to disasters, and solve problems on a global scale.

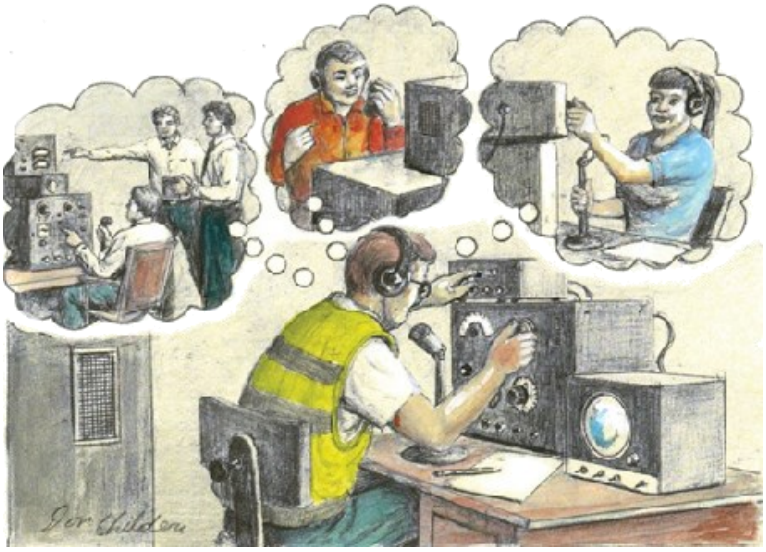


Figure 2 – The Ham Communicator [1]

Communicators understand radio and respect new technology, but view it more as a tool to support communication than as an end in itself.

We all know hams who have a communicative focus. These are the operators who may lean towards extroversion and who may have a broad social network. To them, amateur radio is "all about the destination" rather than about the technology. To the communicator, technology is infrastructure: they will know just enough about it to use the radios, repeaters and networks and to ensure that it will work and support the communicative goal.

A good analogy for the communicator's perspective is the annual summer vacation: some people look forward to the journey (the flight, the airport experience, or the long drive to the destination while looking out the window), while other people see the journey as something that must be undertaken in order to arrive at the beach.

If interest in the communicative goal rather than the technology is your perspective, then you have a communicative focus for amateur radio.

Middle Ground?

Reality (and amateur radio) is not "black and white" and in actuality I think it would be very hard to find an amateur whose interests and motivation are docked one hundred percent in either the technological or communicative harbours of amateur radio.

Chances are that you (and I) have a primary motivational interest in our hobby, but that you have a percentage of interest in the "other camp's" motivational factors as well.

Some hams are technologists but also have a strong communicative focus. Some start out with a communicator focus but their social (or applied communication) goals are not met with any existing technologies, so they decide to shift their attention to amateur radio technology and invent new systems or modes that will meet their original social goals [2].

So what does this mean, and why is it important?

Amateur radio is flexible, and in practise each motivational perspective informs and complements the other. Technologists can assist communicators during emergencies or community events by improving system capabilities or performance, and communicators can generate ideas for procedural improvements or new modes which will help them fulfill their goal of improving the communicative effectiveness of radio systems.

The point is that neither motivational class of hobbyist can support amateur radio as well as both groups can when they work together. This folds back into the higher goal of amateur radio and why our hobby exists.

Amateur Radio's Purpose

I wrote a bit about this last issue. Recall that governments internationally support amateur radio not just because they like it, but because it is good government policy to do so. Most nations' legislation in support of amateur radio contains language that I will paraphrase (and describe) as follows:

- "Amateur radio's purpose is to advance the state of the radio art":
  - Radio is a critical technology because it is a a source of innovation, and every nation should support experimentation which will help advance the effectiveness of radio technology
- "Amateur radio can provide support to government and the community in the event of emergencies that affect critical infrastructure":
  - A vibrant amateur radio community can be quickly mobilized to assist government in time of disaster or in the event of emergency response
  - Amateur radio is a decentralized activity with operators located throughout the community. Each operator maintains their own radio equipment yet is able to communicate with other operators due to standards that are developed and supported by the amateur community itself
- "Amateur radio provides a pool of capable radio operators which may be drawn upon by government in time of national emergency":
  - Historically, amateur radio has been a source of trained radio operators for the government in the event of war or other complex emergency

- "Amateur radio supports community service":
  - Amateur radio supports civil society in the planning of events and contributes to the responsible and well-coordinated operation of these events
- "Amateur radio supports science, learning and higher education in society":
  - Government support of amateur radio enhances understanding of science, engineering and radio technology amongst the citizenry and fosters effective use of that technology.
  - People with amateur radio experience often seek higher education in technological fields and contribute to innovation within the nation

Key to each of these points is that the technological and communicative perspectives of individual hams drive the effectiveness of amateur radio's activities. For example, a reserve pool of capable radio operators will be more effective if those operators not only understand how to build antennas, deploy equipment, and maintain it, but also how to use it on the air efficiently. Technology in and of itself is useless without those who know how to operate the equipment!

Why is Your Perspective Relevant?

Why does one's motivation about amateur radio matter? It matters because the both the technological and communicative perspectives towards amateur radio complement each other and work together to meet amateur radio's overarching purpose. The word "synergy" is overused, but in this case is applicable because the sum of the perspectives (the effectiveness of the overall radio operation they generate when working together) is more than each of them could achieve alone.

Ham radio is a hobby, but nonetheless it is important for all of us to (sometimes) stop and think about the bigger picture. What motivated me to get involved in amateur radio? How would I classify myself? Do I have enough of an understanding of the perspective of those in "the other camp?"

My Own Perspective

I have a strong technological interest in radio, and my desire to learn how radio and radio systems work was my primary motivation for getting involved in amateur radio way back in the mid-1970s. I was interested in communicating, certainly, but primarily because successful communication proves that your systems are working. The content, and the broader perspective of the impact that my communications would have on society, were of lesser interest to me.

This is not to say that I did not appreciate the role that amateur radio can have in public service, emergency response and the like, rather that it was not my motivation for getting involved in amateur radio in the first place. Despite my technological focus, when I was a new ham I quickly became involved in a very active community service amateur radio society called ARCA [3] and provided communication at events of all types for several years. I understood the communicative perspective (and learned of the strong public service history of amateur radio) and participated frequently in that role to help the community and support these important (and fun) events.

My original motivational interest in radio has, however, stayed the same, and 45 years after I was first licensed, I remain just as enthusiastic and curious about radio technology in all of its forms as I was when I was a young adult (see Figure 3).

Figure 3 – VE7PSA and VE7ZD (then VE7CPT) at Club Station VE7SFU, 1981

In recent years my interest in radio technology has moved from the analog to the digital realm and I have worked hard to learn as much as I can about DSP, software-defined radios (SDRs), the new digital modes, and the mathematical foundation of radio. DSP and SDRs are the future of radio.

Analog Versus Digital Radio

I must make a short aside. One of the things I find most interesting about digital radio and DSP techniques is how they can describe concepts such as modulation, demodulation, filters, noise reduction and many other important ideas in radio perfectly: not as an approximation, but perfectly!

The mathematics (which is not so difficult that any of us can't understand it) can define a perfect [4] filter, a perfect modulator and demodulator, and similarly precise other radio system design elements. With DSP an entire radio system can be perfectly modeled mathematically.

The rub, however, is that until recently implementing a digital radio to meet these mathematical models was impossible in practise: the necessary computing power did not exist. Radio systems were built out of analog components because a DSP based system was not possible. Thus, analog design was the "state of the art" in amateur radio (and in fact for all radio systems) for almost one hundred years.

Here is a key point: in actuality, an analog radio is just an approximation of the mathematics of any radio system.

I find this fascinating, and the impact of this observation represents a quantum leap in radio and electronics technology. With the incredible advances of digital technology since the 1970s, digital radios are now practical. It's a new world: we will be able to say that we lived through this technological revolution!

Until about twenty years ago, computers lacked the processing power, memory and throughput capabilities to perform DSP operations (i.e. implement a mathematically based perfect radio) in real time. Now that DSP and SDRs are possible (as computing power has greatly improved), analog radio will become obsolete. Orders of magnitude improvement in system performance (sensitivity, selectivity, et cetera) will relegate the analog radio, at least for new designs, to the recycling pile.

I am sure that analog radios will continue to exist, perhaps being used as teaching tools, but I can think of no practical future for them in science or in industry. DSP and SDRs offer so much better performance with much more inexpensive manufacturing, design and support requirements that it would be indefensible to reject DSP technology in favour of analog.

We are seeing the power of digital radio within the amateur radio community with the proliferation of DSP-based transceivers and new digital modes, such as PSK31 and the several modes encapsulated in the popular WSJT-X application. We can see the efficacy of these new digital radios and modes when, for example, CW and SSB communications on

our ham bands is “dead”, with no apparent propagation, but firing up FT8 on the same band will get you decodes from a dozen or more stations. This is the power of DSP.

Developments in CN79

Time for a short update on current projects.

A) Chart Recorder Interface:

I described my efforts to get the 1950s analog chart recorder that I found in a second-hand store in Chemainus interfaced to an ATmega (Arduino) microcontroller last issue. I wanted to be able to write to the chart recorder from a modern computer.

The challenge was that the chart recorder needed a couple of hundred milliamps of current and that was far beyond the current output limit of the DAC (Digital to Analog Converter) chip that I was using with the ATmega device (about 20 mA maximum).

I didn’t know enough about operational amplifiers (“op-amps”), or how to buffer (isolate) the low current DAC output so that the op-amp could amplify the current, so I had to do some reading [7]. I found a good op-amp tutorial [8] and over the course of a couple of weeks tried breadboarding a circuit using one of the most common op-amps and a common NPN transistor. See Figure 4 below.

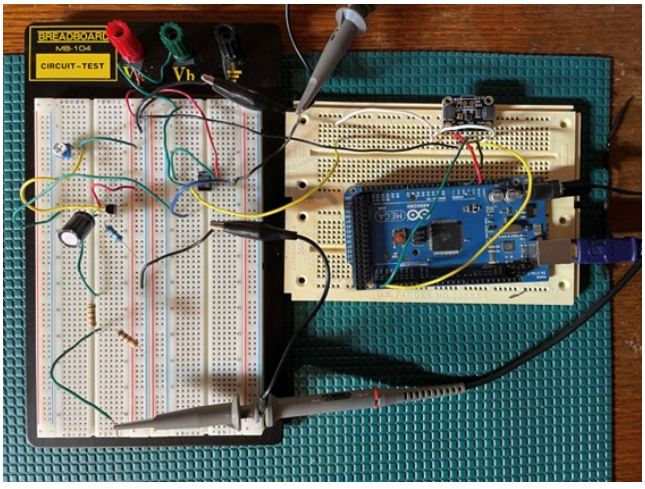


Figure 4 – Breadboarded Chart Interface Circuit

The interface didn’t work at first, but eventually with a lot of experimentation and more reading I figured things out, and the chart recorder interface works pretty well. Time to design a little PCB (printed circuit board) for it!

I used the freeware “Eagle” schematic drawing and PCB design software for several years and have mentioned it before in this column. The application was sold a few years ago, and the new owner changed Eagle’s freeware model when it added some new features to the package. Eagle is still free, but it now requires a license renewal every few weeks, or alternatively, the user can purchase a license for several hundred dollars per year.

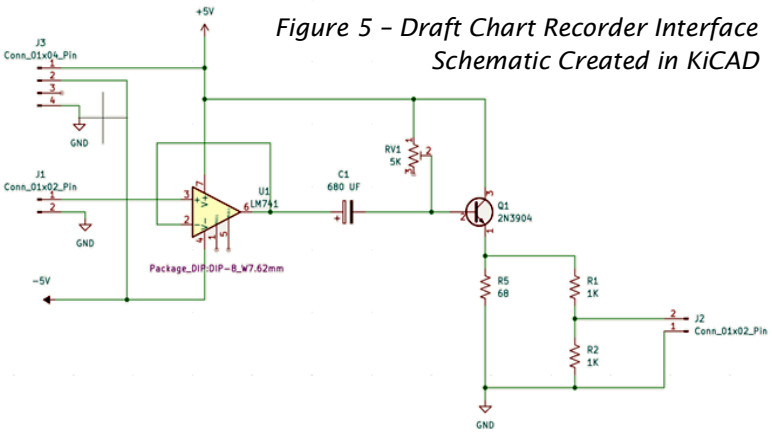


Figure 5 – Draft Chart Recorder Interface Schematic Created in KiCAD

This change has proven to be a non-starter for casual users and many people in the amateur radio and “maker” communities, so they have largely switched over to another free, open-source schematic/PCB package called “KiCAD” [9]. I thought that the chart recorder project would be a good way to see what KiCAD has to offer. I also learned that the name is pronounced “Key CAD” from my discussion of the package with my colleague Dennis AC7FT.

I was able to draw the schematic for my chart recorder interface pretty easily (see the draft in Figure 5), and will take a stab at designing my first KiCAD PCB layout once I get a couple of consulting projects done here at the new QTH.

KiCAD has a ton of great features, and the user interface is very similar to that of Eagle and other commercial schematic/PCB software packages. There are only a few features in Eagle that are not implemented in KiCAD.

B) 23cm EME Station:

In the last week I completed my initial 23cm (1296 MHz) EME station re-install (after the move of all the gear from CN89) and finally got back "on the moon". The noise floor is much lower than in Burnaby, and I took the opportunity in the move to shorten some feedlines and replace multiple coaxial adapters with lower-loss semi-rigid coaxial cable. Working with 0.141-inch semi-rigid coax will be covered in a future column!

I've made 10 contacts with the new EME installation, including a QSO with OJ0EME, an EME-only DXpedition to "Märket" (Market Reef), a tiny 3.3-hectare island in grid JP90nh, in the Baltic Sea between Finland and Sweden. See Figure 6 below.

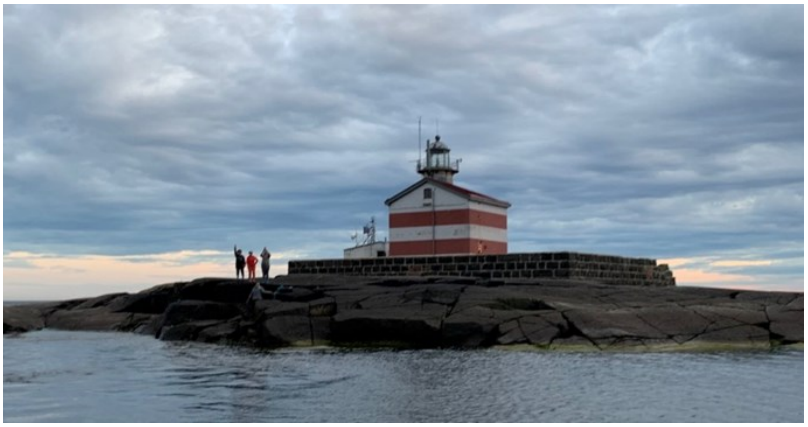


Figure 6 – OJ0EME DXpedition Team on Market Reef

My EME operating position is outdoors on a folding table beside the 2.4m dish (see Figure 7), so a project for the rest of the summer and fall is to get cabling and feedline back into the shack so I can move indoors for the winter months.

Figure 7 – Temporary EME Operating Setup

C) 3D Printed Knobs:

My friend Greg Franklin (VA7BC) took a creative leap and acquired a 3D printer a few months ago. He is on the learning curve, but has been producing a number of 3D items in order to learn about the technology and get his printer fully configured. It is a complex undertaking. Greg did his research and bought a well-regarded printer called a MK3S+ from a company called Prusa 3D in Czechia. They're on the web at https://www.prusa3d.com/.

I had seen some sample prints from Greg's setup and his 3D-printed items looked really good.

Serendipity entered the picture when I had two things break (on two different pieces of test gear) here in the shack. My Tektronix digital scope (TDS210) lost a knob during the move from Burnaby, and my Agilent E3630A power supply had one of its pushbuttons split in two. This was likely due to age, as when I searched online for a replacement, I learned that several people with the E3630A had also had this happen to their device.

The test gear would work with missing knobs but I thought I should look for replacements. Off to the web I went.

To my surprise, finding a replacement knob and button wasn't easy. There weren't many choices available and most of them (at least the affordable ones) were for different models of equipment.

My thoughts drifted to Greg and his new Prusa 3D printer: maybe he could print some new knobs for me.

Not sure if Greg would have the time to help, I packaged the idea as "an ideal learning opportunity" and sent a short email to him to see if he would print some new parts for me. My plea was successful, and with the aid of a 3D printing web repository that I had never heard of before (probably just because I was not a user of the technology) called the "Thingiverse" [5], I found models of both the knob and the button which could be loaded and printed.

Greg reviewed the models as to suitability, and after a couple of modifications to them he was able to print me a few copies of both the knob and the button. See Figure 8 below left. The quality was great, and I installed one button and one knob on my devices and kept the spares for potential future use in case other knobs or buttons ever break. The installed replacement button is shown in the right half of Figure 8, on the "METER/+6V" position. It's indistinguishable from the stock buttons.

3D printing technology is amazing, and although there is a fairly steep learning curve it might be something to get involved with, especially if you are building amateur radio gear or components of any type.

D) Gnuradio Conference:

I've written about the excellent open source SDR radio testbed called Gnuradio [6] in this column several times. I'll be attending the annual Gnuradio conference in Tempe, AZ this coming September, and am scheduled to give a presentation on how tools like gnuradio can be used to introduce hams with little to no SDR experience to digital signal processing techniques.

The conference is always very interesting, and leading researchers in industry, government and academia present on their work using the gnuradio package. The last conference I attended (pre-COVID in 2019) included excellent presentations on deep space communications, machine learning, and how gnuradio is being used in universities and colleges to teach basic radio systems to engineering students and

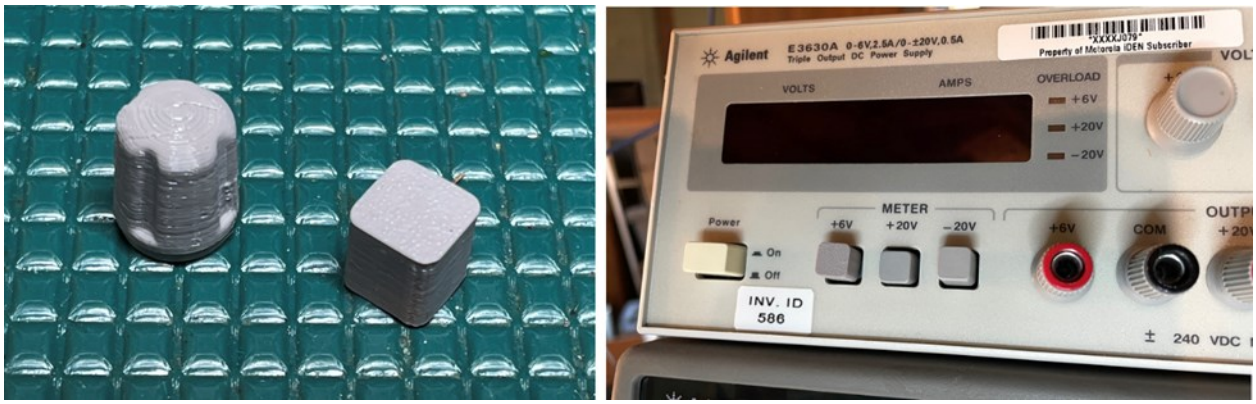


Figure 8 – 3D Printed Replacement Test Equipment Knobs; Knob on Test Gear (6V Pushbutton)

taking the place of traditional analog electronic labs. This type of training would be great for amateur radio operators as well.

I'll have a report on the conference for the next Communicator!

Conclusion

That's it for this issue. Feedback, including questions on this article can be directed to the Editor, or directly to me at mcquiggi@sfu.ca. Thanks for reading!

73,

~ Kevin VE7ZD / KN7Q

References:

[1] Image from https://www.backwoodshome.com/amateur-ham-radio/.

[2] A great example of a "communicator" ham becoming a leading edge "technologist" will be the subject of a future column!

[3] ARCA was the "Amateur Radio Communications Association" and was founded and run by a preeminent local amateur named Tony Craig VE7XQ (SK). ARCA had over one hundred members, two portable repeaters, and provided support to nearly fifty community events every year. The organization started in the late 1970s and was active until about 1992. See the latter part of https://www.legacy.com/us/obituaries/legacyremembers/anthony-craig-obituary?id=46152836 for a good description of ARCA's work.

[4] By "perfect" I mean a filter or other radio "design elements" such as filters which are essentially free from harmonics, ringing, distortion, degradation or other negative factors that have always plagued designers of analog electronics. DSP can create much more accurate design elements than can be achieved through analog techniques. As computing power improves, these digital design elements will only improve further.

[5] The Thingiverse is a global repository of 3D printing designs. It contains thousands of items from the mundane to the highly specialized. The repository is at https://www.thingiverse.com/.

[6] See https://gnuradio.org. Gnuradio is the de facto standard application for anyone interested in learning from scratch about software-defined radio. It has a definite learning curve, and additional reading and a lot of experimentation will be required to come up to speed, but gnuradio is a great tool and you can learn a lot (and even develop your own working transmitters and receivers) using it. For additional reading I highly recommend "The Scientist and Engineer's Guide to Digital Signal Processing" by Steven W. Smith, Ph.D", a 640-page book available for free at https://dspguide.com. It's an excellent plain language introduction to DSP for those entirely new to the field.

[7] A fairly good tutorial entitled "Operational Amplifier Basics" is located at https://www.electronics-tutorials.ws/opamp/opamp_1.html.

[8] Another tutorial I reviewed was "Op-amp Basics" at https://www.instructables.com/Op-amp-Basics/.

[9] See https://www.kicad.org/ for a free download and full documentation and tutorials.

Ham almost cooks dog

By HACKADAY / JENNY LIST

Hackaday
Original Article:
Ham Almost Cooks 'Dog | Hackaday

For those of us licensed in other countries it comes as something of a surprise to find that American radio amateurs now have to run RF exposure calculations as part of their licence requirements. [Ham Radio Crash Course] as approached this in a unique fashion, by running around 800 watts of 6-metre power into a vertical antenna festooned with hotdogs. That's right, this ham is trying to cook some 'dawgs! Is his station producing dangerous levels of power that might cook passers-by?

Of course, aside from a barely-warmed line along where the 'dogs were attached to the antenna there's no heating to be found. But we think he's trying to make the point in the video below the break about the relative pointlessness of applying RF field limits which are definitely relevant at much higher frequencies, to hams at low frequencies.

It leaves us curious as to how that 800 watts could be efficiently transferred into the sausages and really cook them. Strapping them to a vertical is we think the equivalent of strapping anything resistive to a conductor, they do not form a significant enough part of the circuit. We think that even six metres could cook a sausage if it could be efficiently coupled into it, so we'd suggest putting a grounded sausage up the middle of a close-wound helix.

If you have any thoughts on the RF exposure calculations, or on the best way to cook a 'dog with 6m, we'd love to hear the, in the comments. Meanwhile, this isn't the first piece of 'dog-based shenanigans we've brought you.

~ Hackaday / Jenny List

Transceiver installation in a late-model Ford Ranger

Enhancing Communication On the Go:

Installing an Amateur Radio Transceiver in Your Vehicle

By JOHN SCHOUTEN VE7TI

John Schouten VE7TI is active on HF, 2m and 70cm.

Amateur radio enthusiasts understand the thrill and importance of seamless communication, including while on the move. Whether you're a pepper, an urban commuter, an outdoor adventurer, or simply an avid radio hobbyist, installing an amateur radio transceiver in your vehicle can significantly enhance your communication capabilities compared to a handheld portable transceiver. In this article, we will guide you through the process of correctly installing an amateur radio transceiver in your vehicle, ensuring you stay connected wherever you go.

Step 1: Research and Selecting the Right Transceiver:

Before diving into the installation process, it's crucial to research and choose the right amateur radio transceiver for your specific needs. Consider factors such as available bands (frequency range), power output, features, and compatibility with your certificate class. Ensure that the transceiver you select is suitable for vehicular use, designed to withstand the challenges of mobile installations, compliant with any distracted driving legislation in your jurisdiction and provide reliable performance on the go.

Step 2: Prepare the Necessary Equipment

To install your amateur radio transceiver, you'll need the following equipment:

- Amateur radio transceiver: The core component of your setup.
- Mobile antenna: Select a high-quality antenna suitable for vehicular installations *[more on this below]*.
- Coaxial cable: Choose a low-loss coaxial cable with the appropriate flexibility, thickness and length to connect the antenna to the transceiver.
- Mounting bracket: If it is not already provided, find a sturdy mounting bracket or radio holder to securely affix your transceiver within the vehicle *[see the hint on bracket-less installation below]*.
- Power supply: Determine whether your transceiver operates on 12V DC power or requires a power converter.
- Necessary tools: Gather tools such as a wrench, drill, wire cutters, and screwdrivers for installation.

Step 3: Mounting the Transceiver

To ensure a secure and convenient installation, follow these steps:

Identify a suitable location. If your unit has a removeable 'head', so much the better. It will be a much simpler installation. Find an optimal spot within your vehicle to mount the transceiver. Consider accessibility, visibility, and interference factors.

If you are installing a two-component unit, consider attaching the hook part of hook & loop tape (Velcro) to the bottom of your transceiver body and pressing it into the carpet below the passenger seat. It will lock there very securely (I have difficulty lifting mine off again). I suggest the passenger seat because there is often a computer under the driver's seat, and proximity may interfere with it when you transmit.

The main transceiver body under the passenger seat secured with the hook part of Velcro tape.

Find a convenient location for the head unit. On my late model Ford Ranger it sits in a tray at the centre of the dash at eye level but you may have another convenient spot. I was able to lift out the tray, drill a hole in the side, and insert a rubber grommet. I could fish the radio wire and a spare USB lead for my dash cam through to the floor with a length of straightened coat hanger wire.

The head unit sits in a tray in the centre of the dash

For a one-piece transceiver, attach the mounting bracket. Use appropriate screws and tools to fix the mounting bracket securely in place.

Install the transceiver. Place the transceiver onto the mounting bracket and fasten it using the provided screws. Ensure a snug fit to minimize vibrations.

Step 4: Installing the Mobile Antenna

To maximize the range and performance of your amateur radio transceiver, follow these guidelines…

Determine the antenna location. Choose a spot on your vehicle that offers a clear, unobstructed path for the antenna's signal transmission and reception. The center of your vehicle is ideal as a ground plane but often is not convenient. A metallic location works best. On my truck I found a convenient hole under the bed caps *[photo below]*.

Attach the antenna mount. Depending on the type of vehicle and antenna, you may need to drill holes, use a bracket or use magnetic mounts to secure the antenna. An NMO type mount is generally the most universal. If your mounting surface is curved, consider a tilting mount such as the one shown. They require no drilling and mount on a hood, trunk or other lip and can be adjusted in two directions to ensure the antenna remains vertical.

Install the antenna. Choose a single, dual or tri-band antenna depending on your transceiver's band capabilities. Attach the antenna to the mount, ensuring a firm and waterproof connection. Follow the manufacturer's instructions for properly grounding the antenna.

But which antenna? The most common, a 1/4 wave whip, requires a metal ground plane. That metal surface makes up the missing half of the dipole, so it has to be attached firmly. For use in areas away from repeaters, consider a 5/8 wavelength whip instead. This will bring the radiation pattern down to provide a better signal and the increased gain that is often needed in remote areas.

Route the coaxial cable. Use thin, good quality cable such as RG-8X. Thicker cable is better but difficult to route in a vehicle. Be careful not to kink or make sharp bends. Run the coaxial cable from the antenna mount to the transceiver location, minimizing cable length and avoiding potential hazards or sources of interference.

Connect the coaxial cable. Attach one end of the coaxial cable to the antenna connector on the transceiver and the other end to the antenna mount. Ensure a secure and weatherproof connection, using a good quality tape or coating. And remember to check the SWR! We can help you do that at the OTC.

If routing is impossible, consider a magnetic mount (mag-mount) antenna or an antenna that attaches on the glass of your vehicle. The glass acts as a capacitor and results in a no-hole mount.

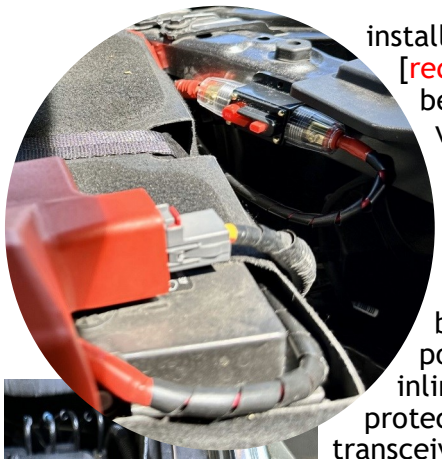
Step 5: Powering the Transceiver

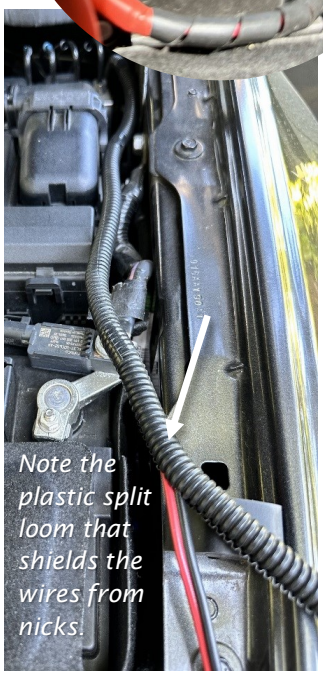
Powering your amateur radio transceiver in a vehicle requires careful attention to electrical connections.

When installing an amateur radio transceiver in a vehicle, it has generally been recommended to use two fuses for optimal protection and safety, but recently opinions have changed on both the use of fuses and whether there should be one on both the positive and negative lead. Let's explore why this is the case.

Fuses are subject to the elements under the hood of your vehicle. Corrosion is not unusual and this can lead to unpredictable and erratic operation. Circuit breakers are now the preferred choice. These are available in various power ratings at automotive stereo shops, Amazon and other on-line sources.

A circuit interrupter for the power supply. The first fuse or circuit breaker should be





installed in the [red] power line between the vehicle's electrical system and the transceiver as close to the battery as possible. This inline device protects the transceiver and the vehicle's electrical system from potential faults or electrical surges. It acts as a safeguard against excessive current flow and helps prevent damage to both the transceiver and the vehicle's wiring. The appropriate rating for this inline component should be determined based on the power requirements of your transceiver.

The black (ground) wire should be run to the battery negative terminal and not to the closest ground at the transceiver. Typically a red-black 2-wire 'zip' cord is used.

This is where the controversy starts! Some advocate a circuit interrupter fuse or circuit breaker at the negative battery terminal but, if this fuse blows or becomes corroded, all the current from your radio would seek an alternate path to ground. That would likely be the braid of your antenna cable, and that is not desirable of course. On my installation I connected the black wire directly to the battery negative terminal.

In some radio models another fuse may be located inside the transceiver itself, specifically on the power lead connected inside the transceiver. This internal fuse acts as an additional layer of protection specifically for the transceiver. It helps prevent any potential damage or malfunction caused by internal electrical issues within the transceiver. Should you need to replace it, the rating of this internal fuse should be based on the manufacturer's recommendations for your specific transceiver model.

By using two circuit interrupters in the positive lead, you create a redundant safety system that offers protection both externally and internally. This ensures that any electrical faults or surges are intercepted at multiple points, minimizing the risk of damage to your transceiver and vehicle.

Remember, it is important to choose the appropriate circuit interrupter ratings based on the power requirements of your transceiver and follow the manufacturer's instructions for proper fuse installation. Additionally, it is recommended to consult with a professional or experienced amateur radio operator for specific guidance tailored to your vehicle and transceiver setup.

When routing power leads through a firewall port to the engine compartment, be sure to use a grommet or other heavy insulation around the wires. If you do not, the wires can chafe over time as they jiggle or rub on the metal edge of the port. Eventually this will lead to an electrical short to the car body when conductors are exposed, a potentially dangerous situation. It is often feasible to use the port's rubber stopper or grommet with a little piercing or trimming to provide a good insulated pad between your power

Small hole pushed through firewall grommet for the wire

POWER LOSS AT VARIOUS SWR READINGS AND RESIDUAL POWER

Compliments of Firestik® Antenna Company Technical Support Team

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SWR (Standing Wave Ratio) affects the power output of your radio. The following table shows the effect of SWR for a transmitter with 4 watts of transmitted power.

The formula: Power in Watts x ((SWR-1) x (SWR-1)) ÷ ((SWR+1) x (SWR+1)) = Loss of Power in Watts

* ERP = Percentage of Effective Radiated Power

SWR READING	% OF LOSS	ERP*	WATTS AVAILABLE
1.0:1	0.0%	100.0%	4.00
1.1:1	0.2%	99.8%	3.99
1.2:1	0.8%	99.2%	3.97
1.3:1	1.7%	98.3%	3.93
1.4:1	2.8%	97.2%	3.89
1.5:1	4.0%	96.0%	3.84
1.6:1	5.3%	94.7%	3.79
1.7:1	6.7%	93.3%	3.73
1.8:1	8.2%	91.8%	3.67
1.9:1	9.6%	90.4%	3.61
2.0:1	11.1%	88.9%	3.56
2.1:1	112.6%	87.4%	3.50
2.2:1	14.1%	85.9%	3.44
2.3:1	15.5%	84.5%	3.38
2.4:1	17.0%	83.0%	3.32
2.5:1	18.4%	81.6%	3.27
2.6:1	19.8%	80.2%	3.21
2.7:1	21.1%	78.9%	3.16
2.8:1	22.4%	77.6%	3.10
2.9:1	23.7%	76.3%	3.05
3.0:1	25.0%	75.0%	3.00
4.0:1	36.0%	64.0%	2.56

leads and the firewall hole's edges. I use a cut-off metal coat hanger to probe though the grommet and then connect the wire to the end to pull it through, finishing the job with a split loom cover.

Wiring the power supply. Use appropriate wire connectors, ensuring a secure and reliable connection between the transceiver and the power source. Use a cable wrap and zip tie everything!

Conclusion

Installing an amateur radio transceiver in your vehicle opens up a world of communication possibilities while on the move. By carefully selecting the right transceiver, installing a high-quality antenna, and ensuring a proper power supply, you can enhance your ability to connect with other radio enthusiasts, emergency services, and public service agencies. Follow the steps outlined in this article, and enjoy the benefits of seamless communication wherever your adventures take you. Stay safe and happy exploring the world of amateur radio from the comfort of your vehicle.

The Communicator has published several articles related to mobile radio installation:

November/December 2019 Page 30, the one or two fuse question on page 34 and fuses or circuit breakers on page 48.

In the May-June 2022 issue you will find an in-depth article about fuses and circuit breakers on page 55 and that issue has another article on the one or two fuse debate on page 62.

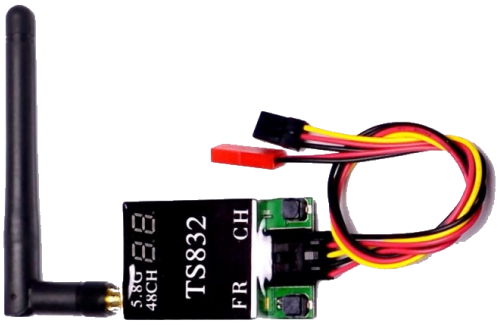
~ John VE7TI

TV Repeater's REPEATER

DRONE 5.8GHz FM-TV

by JIM ANDREWS KH6HTV

I have been pushing ATV folks to continue using analog ATV, especially on the 5cm (5.8 GHz) band using the extremely low cost (US$30, C$40) drone video kit from Amazon of a complete FM-TV transmitter and receiver. I have written about it in several previous newsletters. We ATV hams here in Boulder, Colorado have also done some DXpeditions with them and gotten some really long distances for ATV contacts. In addition, we added one of the transmitters to our W0BTV, ATV repeater to serve as a 5 cm, FM-TV Beacon running 24/7.



So, all this new excited talk about the IC-905 got me to wondering, just what were some of the performance specs. of the Amazon 5.8 GHz, drone FM-TV gear. The gear has no manufacturer's name on it. Just model numbers. They are TS832 for the transmitter. RC832 for the receiver. Their instruction manuals tell us very little. The only relevant specs. for the TS832 are the channel frequencies (40 channels from 5645 to 5945 MHz),

Jim Andrews, KH6HTV publishes the free TV Repeaters Repeater newsletter via email. All past issues are archived at: https://kh6htv.com/newsletter/

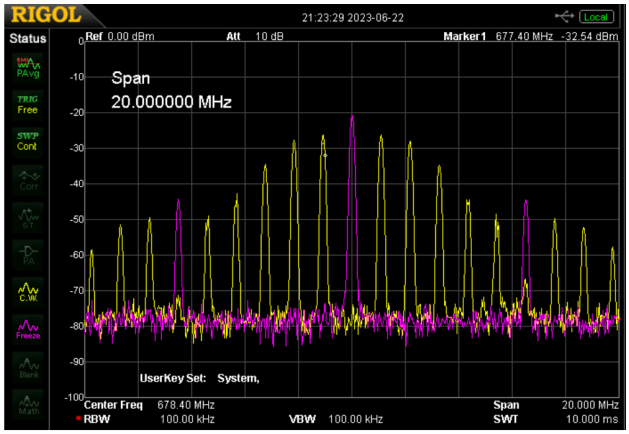
modulation type of wideband FM, output power of 600mW, Sound Sub-Carrier frequency of 6.5 MHz, Video format NTSC/ PAL, Video input of 1 Vptp into 75 Ω, video bandwidth of 8 MHz, audio input of 1 Vptp into 10 KΩ, 12Vdc @220mA.

Key relevant specs. missing are: What is the Deviation? Does it use Pre-Emphasis / De-Emphasis? and if so, to what spec? We here in Boulder have used the gear successfully, but without inquiring about these parameters. Guess we weren't bothered at the time as there was nothing else to compare it with and try to operate interchangeability with. Now with the new IC-905 coming on the market, we do need to be concerned.

So, I decided to at least try to answer some of our questions. I lashed together a test setup to measure the video deviation. I used the system documented in my application note, AN-14 "FM Transmitter Deviation Adjustment & Calibration". The easiest technique to measure deviation is the Bessel method shown there. It consists of putting a 1 Vptp sine wave into the video transmitter and looking at it's rf spectrum. The spectrum consists of a large number of sidebands of diminishing amplitude. Of particular interest is to watch the zero carrier frequency. Slowly bring up the frequency and watch for when the carrier is nulled out for the first Bessel function null.

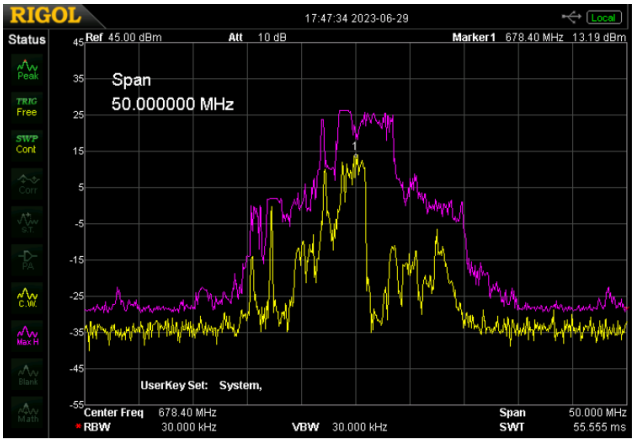
Equation (1) is the modulation index $\chi = D / m$ where D is the deviation and m is the modulation frequency. The first Bessel null occurs when $\chi = 2.405$.

This spectrum analyzer screen grab photo shows the results of the deviation measurement. The span is 20 MHz. The scales are: 10dB/div & 2 MHz/div. The magenta trace is the spectrum with no video modulation applied. All we see is the carrier at 5.905 GHz and the upper and lower sound sub-carriers ± 6.5 MHz on either side of the carrier. The yellow trace is now



Deviation Measurement

with a 1 Vptp sine wave into the video input connector. The frequency of this modulating sine was adjusted to find the first null in the Bessel function. It was measured to be m = 1.086 MHz. Thus putting this value in the above equation, I found the deviation of this FM-TV transmitter to be 2.6 MHz. Not 4 MHz as in commonly used for ATV. However, I did make the assumption that pre-emphasis was not being used in the transmitter. I am unsure how to verify this.



"Live" Video Spectrum

This plot shows a typical spectrum obtained from this same drone transmitter, but the input video signal was typical "live" video obtained from a DVD player playing a movie file. The span is now 50 MHz (5 MHz/div & 10 dB/div), 30 kHz BW. Yellow trace is

capture of a single sweep. Magenta trace was peak hold mode for 3 minutes of video.

The next test I performed was to check the overall video frequency response of a drone transmitter / receiver pair. The transmitter was the TS-832. The companion receiver was the model RC-832. I attenuated the 600mW output of the transmitter with 90dB of SMA attenuators before inserting the signal into the receiver. I input a test sine wave of 200 mV (ptp) into the 75Ω input of the transmitter.

Looking at the receiver output on a Siglent digital oscilloscope, terminated in 75Ω, the output signal was also 200 mV (ptp). Thus 0 dB insertion gain for the combo. I then put the RC-832 video output into a Rigol spectrum analyzer. I measured the swept frequency video response. I found it was flat from 100 Hz up to 1 MHz. It then peaked a bit rising 1 dB at 1.5 MHz and flattening out at +2dB from 2.3 to 5.0 MHz. It then rolled off to help eliminate feed-thru of the 6.5 MHz sound sub-carrier (SSC). It was -3dB down at 5.7 MHz, -10dB at 6.1 MHz and -20dB at 6.3 MHz.

Conclusion?

Well, if your only objective is to do microwave FM-TV on the 5cm band, then there is a very significant 20dB $$ advantage to sticking with the drone gear (i.e. $30 vs. $3,000 for the IC-905). Essentially identical performance, both from an rf and video perspective.

~ 73 de Jim, KH6HTV

Use the Icom IC-9700 as a DTV Receiver

Justin, G8YTZ, sends a note—Check out this You-Tube video. https://www.youtube.com/watch?v=dcIgPK6_qH4 It shows how the PTRX-9700 installed in an ICOM IC-9700 solves all your digital TV reception problems. The video shows a demonstration with the BATC Minituner, plus this solution offers a sound method of receiving DVBT/T2 on 23cm. Skip to the end to see the demonstration, the first part of the video shows you how to install the board into an IC-9700. -Justin is the trustee for the GB3JV ATV repeater for Petts Wood and south -east London.

Use IC-9700 or IC-705 as a 1.2 GHz Downconverter to Receive Analog or Digital ATV: Check out this interesting mod from RadioSpectral.compoll. RadioAnalog.com has a similar product. Whereas it was designed to provide an IF output for an SDR waterfall, it can also provide an IF output to a DATV receiver or analog TV. Some SDRs may allow DATV reception AND a waterfall capability. The 1.2 GHz IF frequency is 320 MHz on IC-9700. The unit also provides an on-frequency output on 2m and 70cm (for example, 434 MHz) for ATV reception. Cost is $228 for RadioSpecral version and $329 for RadioAnalog version. They are available on eBay and Amazon. I'm still investigating but will probably buy one of these for my IC-9700 soon.

https://github.com/radiospectral/ICOM-IC-9700-Panadapter and *https://www.radioanalog.com/*

It is highly likely they will come out with an IC-905 version at some point.

~ Rod Fritz, WB9KMO

Reprinted from the TV Repeater's REPEATER

OHIS Open Headset Interconnect Standard

By MARK SMITH N6MTS

The Amateur Radio community has standards for DC power (13.8v +/- 15%, Anderson Powerpole connectors, etc) and RF (50 ohm coax, PL-259/BNC/SMA connectors, etc). But we have no such standards for the interface between the user and the radio. Is the microphone a dynamic, or electret? Is it balanced, "pseudo" balanced, or unbalanced? Is the audio out from the radio at speaker level, headphone level, or line level? Is it push-pull, or ground referenced single ended? Is push-to-talk (PTT) triggered by a contact closure to ground, completing the Mic loop, or by a serial digital command?

There are so many different standards for microphone, headphone, and PTT that it is improbable that one could take their preferred headset and connect it to any radio without an adapter. In a multi-user environment, such as a club shack, Field Day type event, or an EOC, they would need a full-mesh of adapters to ensure any user can connect their own headset to any radio: O(N^2) adapters.

With the Open Headset Interconnect Standard, or OHIS, the club/EOC can build/buy one adapter for every radio which stays with that radio, and the user only needs to build/buy one adapter for their specific headset which stays with their headset, and now they can achieve full interoperability with only O(N) adapters.

This standard builds on the work done by Tom Tengdin WB9VXY, with his Proposed ARES Standard Headset.

This standard is different than his proposal in a few places to make it more generalized, and provides more detail and clarity around several points

The website (https://ohis.org/) is a work-in-progress as of 2023-05-15. In the mean time, here are some links to OHIS resources:

- Open Headset Interconnect Standard document.
- GitHub repository for OHIS document and other bits.
- Groups.io mailing list for discussing the OHIS standard.

Here's a recorded presentation explaining OHIS and giving a quick summary of the standard.

~ Mark N6MTS

https://twitter.com/SmittyHalibut

https://www.youtube.com/user/SmittyHalibut

mark-n6mts@halibut.com

from

Daniel's Workbench

Daniel Romila VE7LCG

Trying to use a VU-meter for fox hunting

By DANIEL ROMILA VE7LCG & JOHN SCHOUTEN VE7TI

After our annual May foxhunt I asked Daniel for his opinion about adding a visual indicator, such as a meter to a fox receiver. My query was prompted by another hunter who had suffered some hearing loss and had difficulty interpreting minor variations in audio level when direction finding the target fox transmitter.

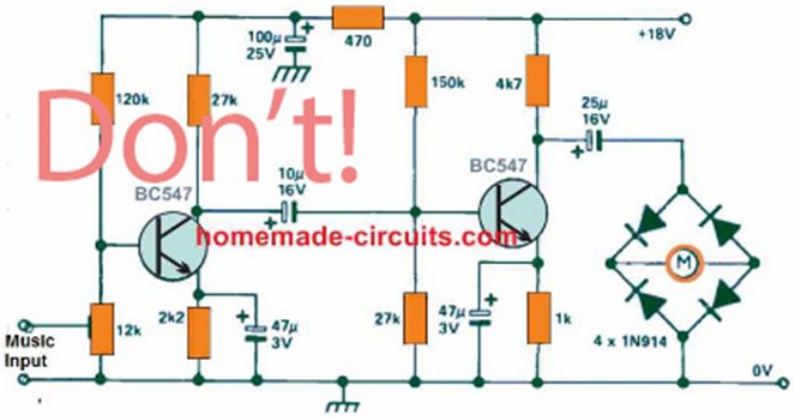
I suggested a small VU-type meter movement, and several emails back and forth brought Daniel to the conclusion that this solution likely would not work. Daniel wrote the following article to record his findings and proposed solutions. My comments are indicated in italics.

~ John VE7TI

In the spring of 2023, I published an article in which I praised the Surrey Amateur Radio Club (BC, Canada) for organizing radio fox hunting.

It was still May 2023 when John (a very experienced radio amateur and instructor from Surrey, BC Canada) contacted me and told me some radio amateurs have hearing problems and this is inconvenient for participating in radio fox hunting. He was looking for solutions and one idea was to use an analog mechanical instrument (voltmeter or ammeter) for visual indication in addition to the audio indication. John found a schematic on the Internet as a

Daniel Romila VE7LCG is constantly experimenting with electronics and has contributed many projects and electronic notes. In this column he brainstormed with John VE7TI to analyze and recommend a potential solution for fox hunters with hearing loss.



possible electronics implementation for such vu-meter.

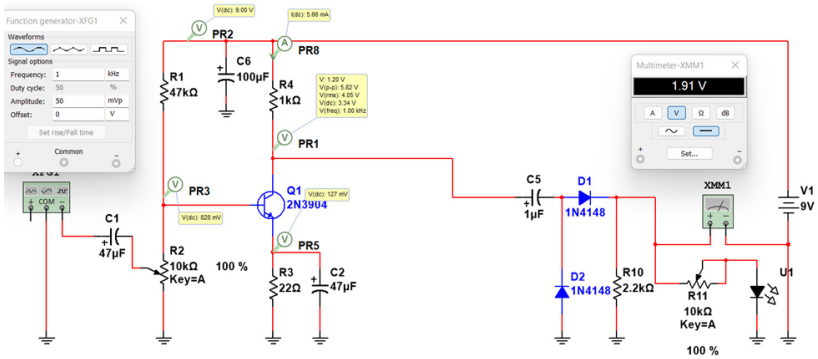
I immediately wrote "Don't! on it, because:

- It is power supplied from 18 Volts, instead of 9 Volts, as the SARC fox hunting receivers are;
- It has two stages, two BJTs in the amplifier configuration. This would be more suitable for a signal from the microphone, and not from the speaker, as John suggested. The second transistor will enter in limitation, which was confirmed by my CAD simulations;
- The input is not separated AC-DC with a capacitor;
- The output transforms AC into DC with a full bridge. That means voltage is lost on two diodes all the time, some 1.4 Volt loss for the 1N4148 Si diodes.

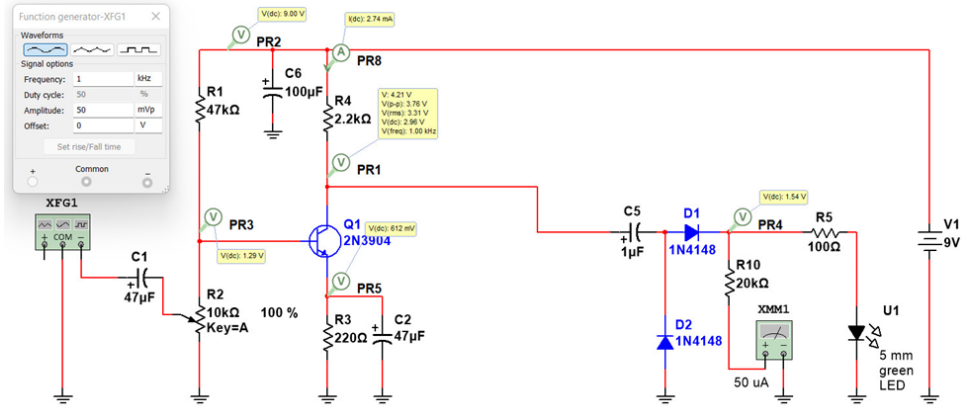
On a separate note, I already expressed doubts about the usefulness of a mechanical analog meter indication for CW. The analog meter has a big inertia. You can already have the receiver in the optimal position for goniometry *[I had to look this one up… it is the practice of establishing the bearing of an incoming radio signal-JS]*, and move forward, past the optimum position, because the analog meter cannot show it as optimal in real time, but after a lapse of second(s). Also, the signal being a MORSE sequence, the analog meter will indicate higher when dahs are transmitted, and less when dits are transmitted, which can mistakenly be interpreted as an indication of the strength of the signal (the direction where the fox is), when actually the indication of the analog meter shows variation of the CW transmitted characters, and not variation of the strength of the signal (direction towards the radio transmitter = fox).

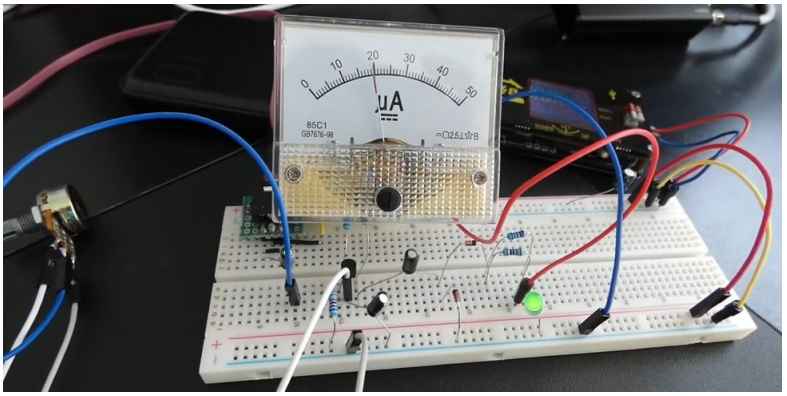
Keeping this note in mind and having forwarded it to John, I went further, to a practical design. Below is the schematic I proposed to John, knowing he wanted to use a voltmeter.

John was very receptive and even scared me that he wanted to try it on the breadboard (LOL). So, since I build all kinds of things on a breadboard anyhow, and had one breadboard with almost everything already on it, here is the schematic I adapted for what I have, a 50 micro-Amps analog meter *[next page]*.



The schematic I proposed to John





You can see this schematic implemented on breadboard on the picture to the right, but also in operation (1 min 53 sec video) at: https://www.youtube.com/watch?v=aMwMlOqsebw

I used as input signal the speaker/ headphones output from my computer, as John wanted to use the speaker output in the fox hunting receivers. You can see in the schematic, on the breadboard and on the video, there is also a green 5 mm LED as visual indication. The LED is fast and followed the VE7MTY beacon CW signal that I used for testing. The analog meter could not follow in real time the CW signal.

The audio from that video comes from a separate receiver, tuned on the same CW beacon. The signal I used on the breadboard has a better quality, because it comes from a software digital radio through a 150 Hz bandwidth filter. So, the sound one can hear in the video is a lower quality than what the vu-meter gets. The vu-meter gets only the pure CW signal and less noise than what you hear. To repeat again, only the green LED is capable of following the CW signal in real time, and the analog meter does what it can: it averages the signal for some second(s), it shows, with delay (some second(s)).

Coming back to the schematic, one can ask if the LED does not – somehow – limit the signal going into the analog meter. No, it does not. The LED is connected in series with a 100 Ohm resistor, and, unfortunately, I do not have any ON/OFF LED diodes, and I am not aware something like this even exist. As seen in the video and explained verbally, the experiment can overload the 50 microAmp meter with signal, while the LED continues to provide an instantaneously indication – no interference LED - vu-meter. The LED also eliminates any charge that would eventually try to build-up on the 1 µF capacitor C5. If you have a 50 microAmp meter in series with the 20 KOhm resistor, as I did (even a 33 KOhm would do the job). If you have something like a 100 uA to 1 mA meter, lower the resistor value towards 4.7 KOhm or even 1 KOhm. Nowadays LEDs accept a variety of currents, and the light follows the strength of the current passing through them.

Since I was very excited about the radiogoniometry thing I started to think about somehow improving the contrast of receiver's sound between being in the right

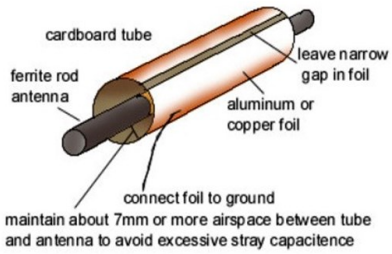
direction and being 90 degrees to it, in addition to the visual indication. A more contrasting sound would help people who do not hear well. I proposed to John some partial Faraday caging experiment:

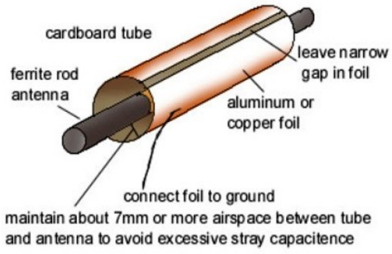
You can see the experiment on a short 4 min and 46 seconds video at:

https://youtu.be/Desy0ubJMpo

I remembered that some 40 – 50 years ago the fox hunting receiver designers used partial shielding of the antenna ferrite rod for modifying the cardioid receiving pattern. It was very difficult to find material about partial shielding on the Internet in English since the original material was from Eastern Europe, and Internet was not widespread when the fox hunting hobby entered into decline.

I was lucky to find it on the Arduino forums:


cardboard tube
leave narrow gap in foil
ferrite rod antenna
aluminum or copper foil
connect foil to ground
maintain about 7mm or more airspace between tube and antenna to avoid excessive stray capacitence


cardboard tube
leave narrow gap in foil
ferrite rod antenna
aluminum or copper foil
connect foil to ground
maintain about 7mm or more airspace between tube and antenna to avoid excessive stray capacitence

https://forum.arduino.cc/t/using-radio-frequencies-to-loosely-determine-angles/697065/9

In conclusion, it looked to me that my vu-meter experiment confirmed an analog meter cannot follow and indicate the strength of a CW fox hunting signal, because it has too much inertia. It is too slow to show the information, and it depends too much on what it is transmitted (short dits or longer dahs) to know if it indicates a strong signal or just a sequence of long lines.

I reasoned that the rapid sequence of dits and dahs in the CW identifier (callsign and fox number) would average out an analog meter reading. In fox hunting you take one reading to find the null—no meter needed and then turn the receiver and press a button to determine if the fox is in front or behind you. This is where the visual level would be an advantage.

I repeated to John the suggestion to use a LED, and the best would be to place the LED on the existing schematic of the fox hunting receiver, without external modifications, and to make a hole into the fox receiver case for the LED. I do not know if John will follow what I said, because he has real life experience with the SARC receivers, and I do not, so our conclusions might differ.

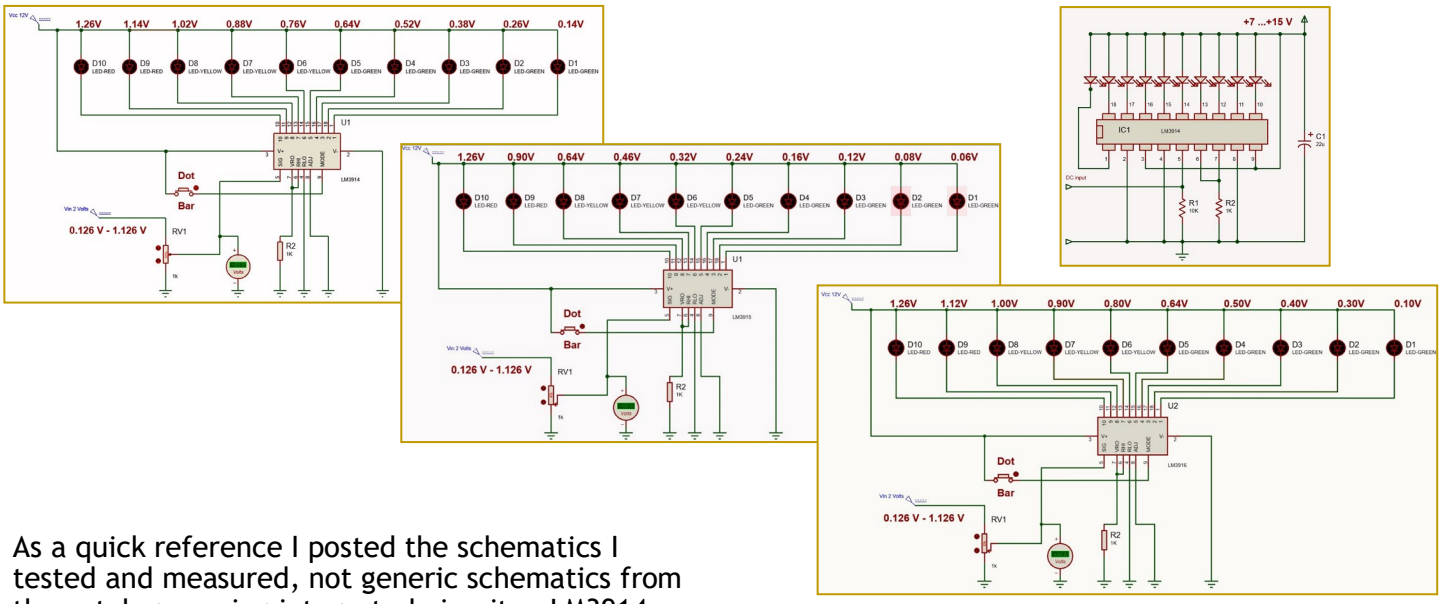
Given the construction of the receivers and lack of internal space, plus the difficulty adding a circuit to the surface mount parts I don't believe it is possible. Perhaps an external unit that plugs into the receiver earphone jack.—JS

For those who want to experiment more with fast LED vu-meters, having several stages, as a sequence of dits, or as a modifying length bar and so on, they can read more in the article "Fun application of the LM3914 and LM3915 integrated circuits", published by me in SARC The Communicator in January 2019, page 26:

https://ia601509.us.archive.org/8/items/SARC_Communicator_2019-01/SARC_Communicator_2019-01.pdf

and also my article "A simple digital S-meter" published in The Communicator in May 2018, page 36:

https://ia801503.us.archive.org/26/items/SARC_Communicator_2018-05/SARC_Communicator_2018-05.pdf



As a quick reference I posted the schematics I tested and measured, not generic schematics from the catalogue using integrated circuits - LM3914, LM3915 and LM3916, respectively.

The computer assisted design program to use for such integrated fast vu-meters is Proteus, because it has in the built-in libraries for the dedicated integrated circuits LM3914, LM3915 and LM3916. The software called Circuit Wizard also has such integrated circuits in its library of components.

I usually draw the schematics in Multisim, so I made custom blocks for the dedicated integrated circuits in Multisim, as you see in the left picture.

A full 11 minute video explaining the Proteus simulation for such dedicated ICs (not by me) can be found at: https://www.youtube.com/watch?v=0xXlpp8UU0I

~ Daniel VE7LCG

Thanks Daniel—JS

RAG CHEWER
DXCC
73 OM, I REALLY MUST SIGN NOW -- MY DINNER WAS READY 15 MINUTES AGO, AND IF I DON'T COME AND GET IT, MY GORGEOUS, VERY PATIENT XYL IS GOING TO FEED IT TO THE DOG!
KGBJH
—73 O.M., I REALLY MUST SIGN NOW - - - - -

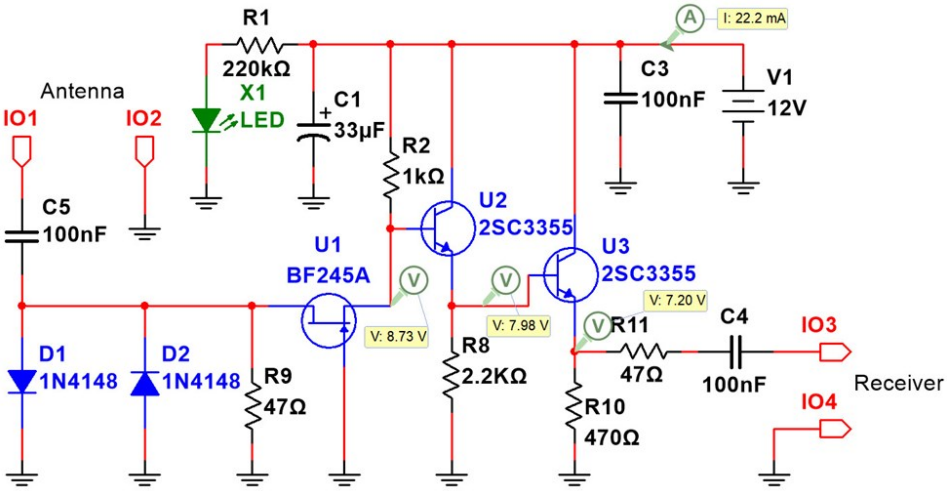
...more from

Simple shortwave wideband antenna amplifier

By DANIEL ROMILA VE7LCG

A spectrum analyzer is a very useful instrument in radio **Daniel Romila VE7LCG** explains why the 'cheap' solution is not the answer.

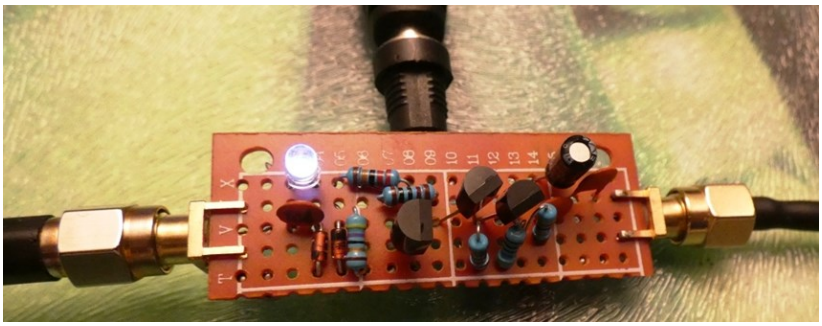
After making sophisticated antenna amplifiers for reception with all kind of specialized components, I wanted to build a simpler one. I wanted something wideband that did not require an attenuator at the input. The amplification had to be somewhere under 20 dB (10 X), in such a way that the amplification of the signal into a stronger one would be manageable by the automatic gain control of the receiver. I wanted something very stable, simple to build and which would not to enter into self-oscillation easily. The resulting schematic on which I settled is shown below.



The first transistor is a FET transistor with the grid connected to ground. The input is done on the source. This type of amplifier is very stable and does not enter into self-oscillation easily. The input impedance is dictated by the 47 Ohm resistor. The two diodes 1N4148 protect the FET transistor against strong signals coming from antenna. The drain of the FET is connected to 12 V through a 1 KOhm resistor. Both input and output impedances for this amplifier stage with FET are low and assure a stable amplification.

The maximum amplification one can obtain with BF245 or MPF102 transistors is 10 times. I put the

voltages generated by the computer simulation on the schematic . In reality my module consumes only 17 mAmps, and the voltages differ very much. The voltage in the drain of the FET transistor is 4.7 V instead of 8.73 V. Replacing the FET with another one I obtained values closer to the computer-generated values. The LED is a transparent white 3 mm round one and lights from several microamps. Any other LED would do, but if you use a 5 mm LED a lower 68 KOhm resistor would be required instead of the 220 KOhm.



The next two transistors are npn BJT ones. I put in 2SC3355, but any other, like the common 2N3904 will do. The noise is dictated by the first transistor, the FET. The next two transistors are just repeaters. The amplifier functioned without them when I tried with a signal generator and an oscilloscope. But without the repeaters the amplification depends very much on the impedance connected at the output. With the two repeaters there is no problem connecting a low impedance like 50 Ohms. I used the idea of putting repeaters in order to obtain a termination insensitive amplifier from:

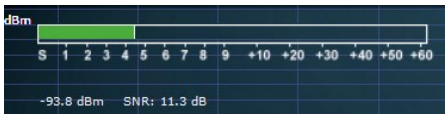
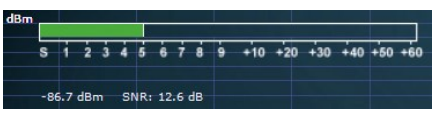
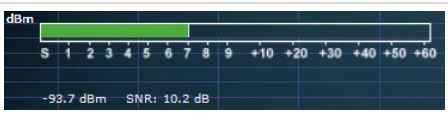
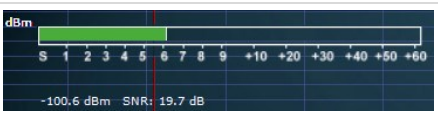
http://w7zoi.net/bidirectional_matched_amplifier.pdf

I soldered everything in less than 30 minutes on a single side perforated board, shown above.

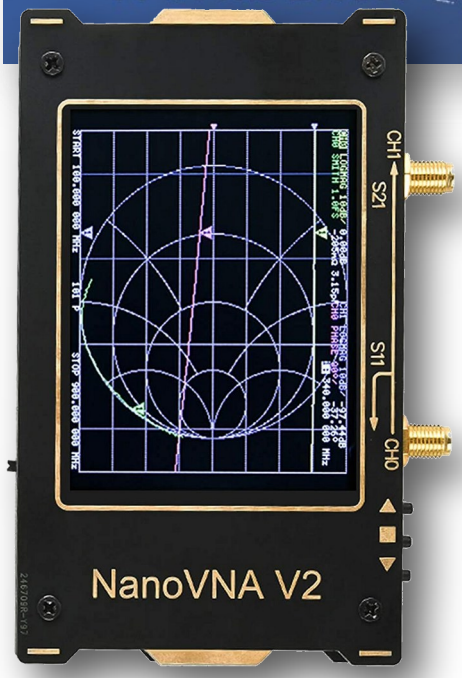
I tested this amplifier in front of an RSP1 Chinese clone and I used the SDR Uno software for measurements shown in the table below.

The antenna amplifier is suitable for under 30 MHz frequencies. I tried it with a weather station and it did not improve the signal on 162.400 MHz and looks like it even attenuates the input signal, so it cannot be used for UHF and VHF.

~ Daniel VE7LCG

550 KHz			19.7 dB (9.7 X) amplifies
28.197 MHz			7.1 dB (2.26 X) amplifies
162.4 MHz			attenuates

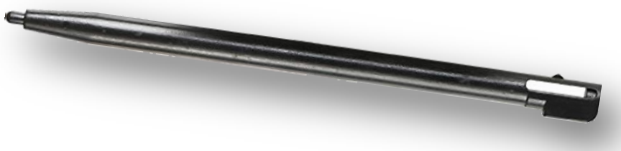
...more from



Starting with NanoVNA v2

A beginner's guide

By DANIEL ROMILA VE7LCG



Daniel Romila VE7LCG provides you with an introduction

The NanoVNA is a Vector Network Analyzer. I bought my NanoVNA v2 in the spring of 2021 for:

- Antenna measurements
- Crystal filter measurements (not described in this article)
- Use as signal generator

Everything written in this article was done by me with a NanoVNA v2 SAA2 with a 3.2 inch screen by itself, not tethered on a computer. Now, at the end of 2022, it is still in my opinion the best bang for the buck among the versions of NanoVNA that can be bought because it knows how to do a maximum of 201 sweep points as a standalone and 1024 points of measurement when tethered to a computer. The published capacity of the battery is 1950 mAh and I can confirm that I could not kill it during long sessions of experiments. The frequency range of my version is 50 KHz – 3 GHz.

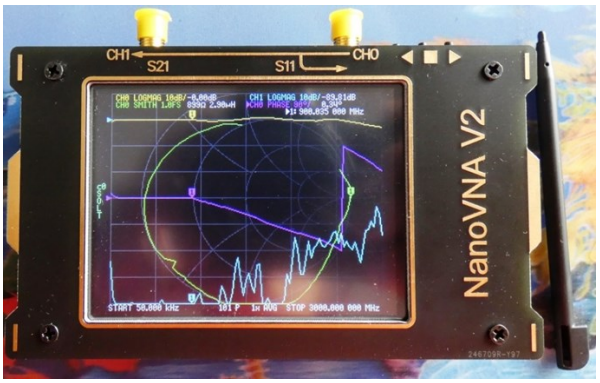
All the procedures described here are similar (most probably the same) on an older version of Nano VNA, the first version – and on the newer versions. I do not have such a VNA to play with, but I watched YouTube videos. I will give links for both versions (v1 and v2), and after each operation I will describe towards videos made by others, if they are short enough.

At the end of 2022 such NanoVNA v2 can be bought from Chinese websites for around $95 CAD,

shipping and taxes included. There might be differences between my screenshots and the version of NanoVNA of readers, not only based on the difference of hardware, but also on the difference of firmware existing on the same hardware. Anyhow, the differences are minimal and more esthetical than functional, so everything written here, for such simple operations, remains functional.

Charging the battery

Nano VNA, all versions, all incarnations, come with rechargeable battery. Before starting any experiments, it is better to fully charge the battery through the provided USB cable. The charging can be done from a USB computer port.



Warning: If the NanoVNA v2 is switched ON while already connected to a working computer USB port the display will start to flicker and will show nothing. This is because the NanoVNA misinterprets the display and the commands will be on/from the computer, not from the tiny box itself. So, switch OFF, unplug from the computer, switch ON and connect again to the computer.

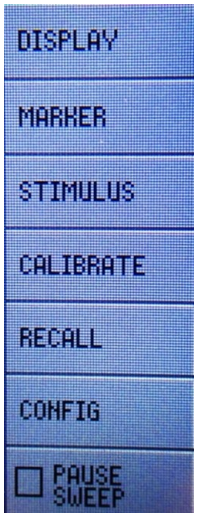
Calibration

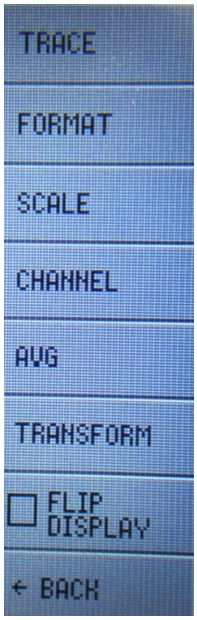
After switching ON the screen will show as in the picture.

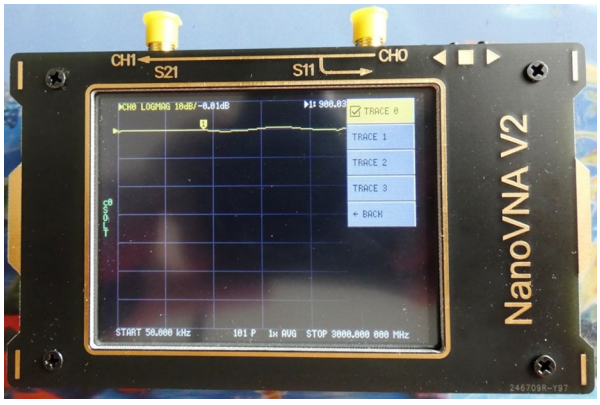
There are four lines (=traces) on the screen. Too much information. Tapping with the finger or with the stylus on the screen will show the menu. Touching the display again outside the menu will make the menu disappear and so on.

First, let's make 3 traces disappear from the screen and have only one trace remain. Select DISPLAY and a submenu will appear.

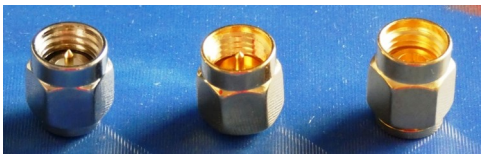
Select TRACE. In the new submenu there are four traces. Tapping them once selects them. Another tap and they become active/shown. Another tap and they are grayed, meaning they are no longer shown on the screen. When only one trace (trace zero) is selected to be shown we can tap again in the middle of the screen or anywhere outside the menu/submenus and the screen will be clean and ready for next operations.







We are ready to do the calibration. We will use the 3 provided connectors. One is a 50 Ohm load, and it has a silver connector, different than the other

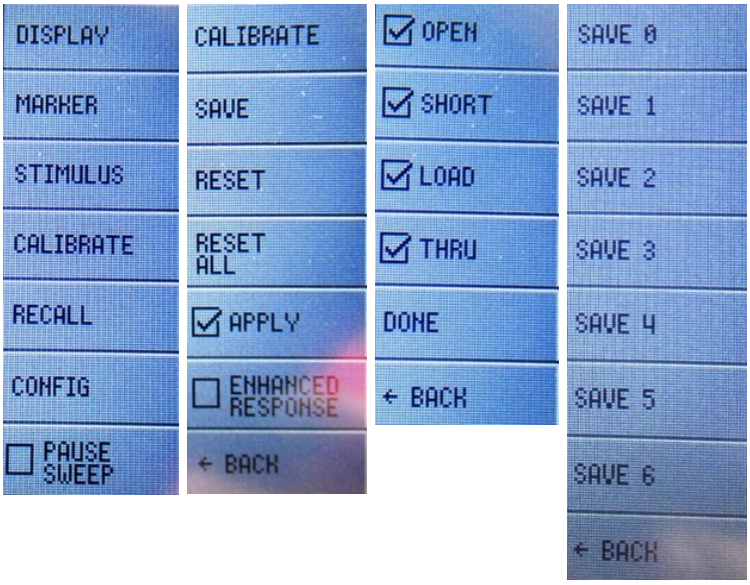


two. One is golden and has no pin in the middle – this is the open connector. The other gold one has a pin in the middle, and it is the short.

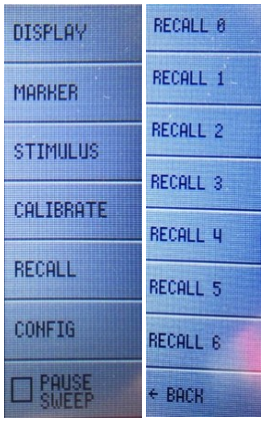
In order to start the calibration process, we need to have the NanoVNA v2 switched ON and to have the main menu on the screen. We tap the screen for the menu to appear. Eventually, we will have to navigate through the pages touching the BACK box (the lowest choice box) to get to the main menu.

Next, we will choose CALIBRATE. It is in the middle of the menu. From the new sub-menu, we touch CALIBRATE, which is on top of the new sub-menu.

There are 4 calibrations we have to do: OPEN, LOAD, SHORT, THRU. We can do those calibrations by mounting the corresponding connector into CH0 and touching the selection. It will take several seconds, and the image will stabilize, with a sign in front. Repeat the same for all 3 calibration connectors. The last calibration is done by shorting CH0 and CH1 with the 2 cables, united through an adapter. The CH0 and CH1 plugs are on top for NanoVNA v2 and on the left side for NanoVNA v1.



When we finish the calibration, we touch DONE and it jumps into another sub-menu, where we can save the values into set 0, for example.



Next time when we start the NanoVNA v2 we can recall the calibration values we already stored in the set 0. We tap on the empty screen, and from the main menu we choose RECALL. From the next sub-menu, we choose RECALL 0.

Warning: All calibrations we did are OK if we use the NanoVNA v2 independently, not tethered to a computer. When using a computer and software on the computer to give commands and show results to/from NanoVNA v2 we have to do another similar calibration, good for that software, with the calibration values stored on that software, not on the software from the NanoVNA box itself.

Others made good YouTube videos showing how to calibrate:

https://www.youtube.com/watch?v=4ti218ZUgaE for v2

https://www.youtube.com/watch?v=OH_UDHk-kpE for v1

Measuring the resonant frequency and the SWR of an antenna

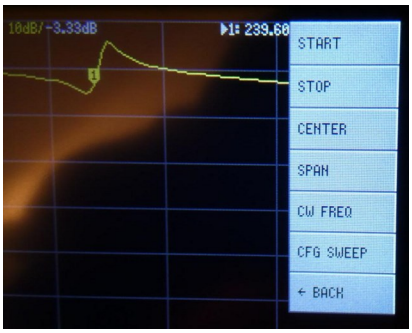
The antenna to be measured must be connected in the CH0 connector. You might need an adapter.

After switching the NanoVNA v2 ON recall the calibration values stored in the set 0, as in the previous chapter.

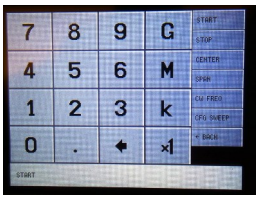
The trace to be followed is trace 0, yellow color. If you do not obtain something as shown in my picture, please verify you indeed have TRACE 0, yellow, on the screen and not something else. NanoVNA v2 might decide to show something else by itself – at least mine does it sometimes.

The resonant frequency is at the minimum of the line. There is a MARKER on the line which can be moved manually with the stylus into the valley. The corresponding frequency can be read on the upper right corner. (We will do it automatically at the end, for the marker to go to minimum by itself.)

Most probably the range of frequencies for which the NanoVNA v2 looks for the resonant frequency is wider than what you want. We need to find in the sub-menus STIMULUS, and after selecting that to decide the START and STOP.



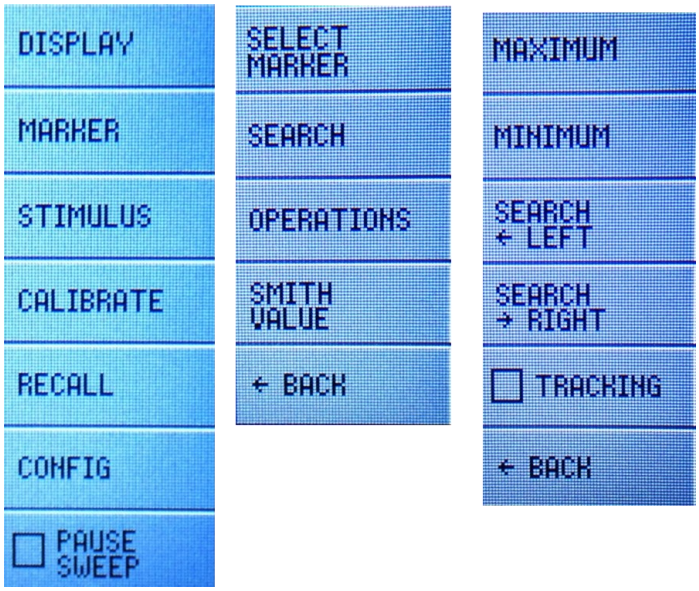
It is also possible to decide the CENTER frequency, and the SPAN.



When inputting frequencies, K stands for KHZ, M for MHz and G for GHz. So, it is easy to establish the boundaries for measurement.

To automatically find the resonant frequency, we need to find the MINIMUM on the yellow line. Tap the screen for the menu. Select MARKER. Most probably you have just the marker 1 on the screen, but if necessary, use SELECT MARKER from the next submenu. Come back into this submenu shown in the second picture bellow. Select SEARCH. From the next sub-menu select MINIMUM.

The resonant value will be written in the upper right corner, also mentioning it is for the marker 1.



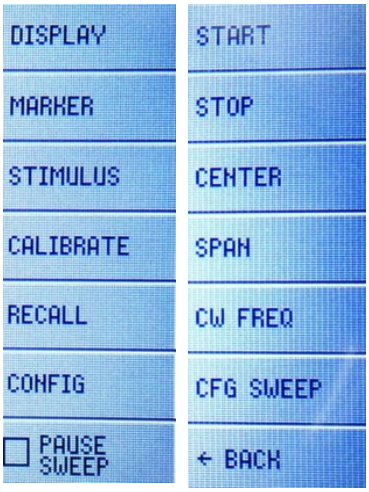
It is also possible to choose to show the SWR on the line (trace 0, yellow) instead of the log scale. Just tap the screen for the main menu. Select DISPLAY. In the next sub-menu select FORMAT. In the next sub-menu select SWR.

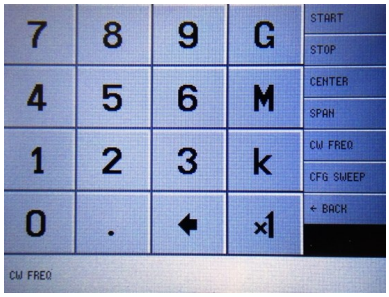
A YouTube video showing some of these operations (for v2) can be seen at:

https://www.youtube.com/watch?v=b88f_DEm5rg

NanoVNA v2 as signal generator

The signal is taken out from the CH0 connector. In order to select one single unmodulated output frequency we have to get into the main menu first. Tap on the screen, and eventually use the BACK boxes (lowest choice) to get into the main menu.





Select STIMULUS. From the new sub-menu select CW FREQ. Next sub-menu allows the input of the desired frequency on a touchpad.

It is also possible to set the generator signal as a small SWEEP, for example with a difference of 1 KHz between the START and STOP frequency. This would sound like an AM modulated signal on the receiver.

There is a YouTube video for the older NanoVNA version, which (at least at that time) did not have the choice of generating one single CW FREQ in the firmware.

https://www.youtube.com/watch?v=ZMIObxVuEy0 for v1, using a sweep in which the START frequency is the same as the STOP frequency, and some more experiments.

~ Daniel VE7LCG

For other NanoVNA applications, Arie Kleingeld PA3A wrote a series of 7 articles for The Communicator starting with the November 2020 issue.

…more from

Mini HF transceivers for 2023

What is out there?

By DANIEL ROMILA VE7LCG

Daniel Romila VE7LCG provides you with an overview of what's available for your budget.

Daniel is not affiliated with either any manufacturer, or with vendors. This article just summarizes his own research for small HF (and not only HF) transceivers.

Just to clarify the title: the HF transceivers listed here are currently available but did not necessarily appear in 2023 for the first time.

The space constrains, wish for mobility, the cost constrains make more and more radio amateurs to want to have small equipment possibly be able to "do it all". This would allow having one transceiver (and to buy only one transceiver) both for home and field operation. The SDR (software defined radio) design permits fulfilling such desires, and also allows it to optionally be connected to a big screen or a big computer and have the feeling of working on large, comfortable equipment again. There are many hybrid combinations and "classic" versions that allow a big punch from a small case. In this article I post pictures taken from the official manufacturers'/vendors' websites.

I would just start with the Elecraft KX2 transceiver for the 80 meter to 10 meter band, which can generate up to 12 Wats, has an internal battery of 2600 mA, weights around 0.37 kG and has an optional automatic internal antenna tuner. When verified on the Elecraft website I found there was a waiting list to buy this transceiver. And if I mentioned the Elecraft KX2 here it should

bring to mind another legend, the Yaesu FT817, still available for purchase in the updated FT817ND version.

The newer model is the FT818, that has an internal battery and max 6 Watts output on the 160-10 meter HF bands, plus the 6 meter, 2 meter, and 70 cm bands (like the FT817). Unfortunately, immediately after writing this article I found the following announcement made by YAESU:

"Please be informed that the production of the FT-818ND and FTM-400XDR will be discontinued. We are forced to make this unfortunate decision due to difficulty we are having with the availability of some components. We appreciate your long-term patronage of the FT-818ND and FTM -400XDR."

The ICOM 7100 is the mobile currently offered from the manufacturer's website. It is capable of HF, VHF and UHF and it has a 2-module construction, where the main RF unit weights 2.3 kG and the controller weights 0.5 kG. This mobile offer is somehow disappointing in comparison with the old ICOM 7000, still available on the Canadian ICOM website.

Kenwood continues to let us down about offering us a small mobile HF rig.

From the not so well known brands, the (tr)uSDX transceiver deserves mentioning, and it is popular because it costs in the range of $175 USD.

There are many clones of this (tr)uSDX available on Chinese websites that do not work well on SSB transmission. The main advantage of such (tr)uSDX transceiver is the price and the main disadvantage is also the price. I am writing this because currently you enter this price range for

hundreds of dollars although there are many cheap offers and more expensive, but with a higher-end look and more features.

One such offer is the XIEGU G106C, a 5-Watt HF only transceiver, capable of SSB transmission. It costs around $375 CAD (=280 USD = 257 EURO = 4790 ZAR). By the way, is XIEGU one of the big manufacturers of radio amateur transceivers or not? I think it is, and maybe XIEGU products should have been in this article in the first section of the big names, not in this second section.

So, the question an amateur radio buyer should put to himself/herself is whether to spend $230 CAD for (tr)uSDX or $375 CAD for a XIEGU G106C? A short look at the last two pictures should generate a response from readers, whatever that response would be.

And if we are already in the $375 CAD range, we can bump ahead to $500 CAD (=374 USD = 343 EURO = 6385 ZAR), shipping and taxes included, for a MCF well known transceiver, which has passed through many versions and upgrades. Some versions have a battery inside, some not, and prices vary very much.

If we add about 50% to the previous price, you can get into more elaborated toys, like the KN-990C HF All-Mode 0.1~30MHz SSB/ CW/AM/FM/DIGITAL IF-DSP CB 11M 27M Amateur Ham Radio Transceiver *[top right]* or the XIEGU G-90 - which is cheaper *[right]*.

The KN-990C transceiver has a dedicated 100 Watts amplifier, named KP-990 *[below right]*.

The observation here is that the big names like Yaesu and ICOM offer mobile/portable transceivers that are also able to work the 50 MHz, 144 MHz and 430 MHz bands.

There is such a not so "big name" transceiver, capable of 18 Watts output, with an automatic antenna tuner, capable of connecting with a big computer screen. Chinese websites sell the transceiver under the name Q900 and Ailunce HS2 (which seems to be the original). It is now at the third iteration.

It costs the same as KN-990, around $750 CAD (=561 USD =515 EURO =9578 ZAR), shipping and taxes included, in January 2023.

Using software-defined radio technology, full-band support
DMR(optional), SSB, CW, RTTY, amplitude modulation and frequency
modulation, the receive frequency is from 100k to 2GHz

~ Daniel VE7LCG

...more from

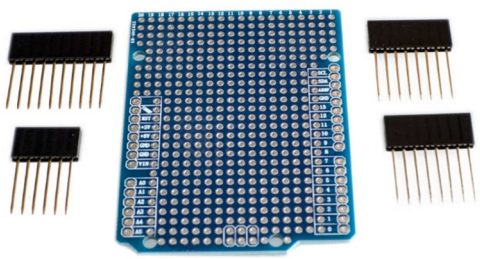
Making Arduino shields with prototyping boards

A guide to help you along

By DANIEL ROMILA VE7LCG

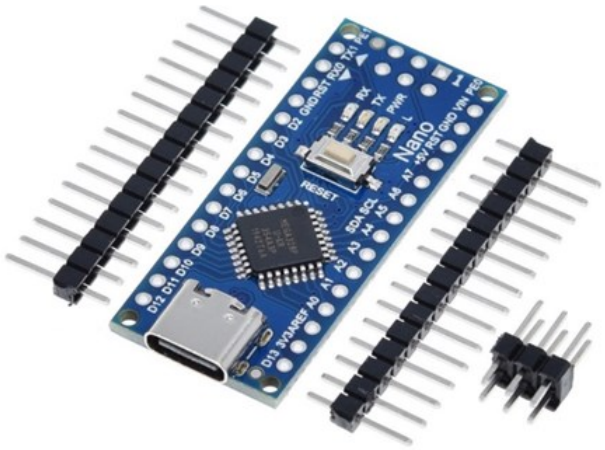
Daniel Romila VE7LCG explains his methods for using shields.

While there are many pre-made shields for Arduino, there are situations when the amateur radio builder wants to try "something else" and simply to experiment. (All prices given in this article are for June 2023.) The subject of this article is about building on the following kind of boards, which can be bought online for around 1.62 CAD a piece (=1.20 USD = 1.11 EURO =23.34 ZAR), shipping and taxes included, when bought in package of four.



These shields fit medium boards from the Arduino family – I am talking here about Arduino UNO. How did I get to Arduino UNO for experiments instead of Arduino NANO? The price for an Arduino NANO board, shipping and taxes included, is 4.30 CAD (=3.19 USD =2.95 EURO =61.96 ZAR), not much cheaper than for UNO.

Arduino NANO is a smaller board, the same general schematic and components as UNO. I use it in final projects, that will have a dedicated design case. If it is to experiment, Arduino NANO has only male pins (as bought). It is uncomfortable to attach too many wires to it because the board itself must stay in the air for the wires to be attached at the bottom. I solder the pins the other way around sometimes because I wanted the bottom of the board to be stable. It is still not stable, because the board is light weight and flies all over when a Dupont wire flies all over. I also tried other types of pins/connectors, like female



connectors on top, which allow wires connected on top of the board instead of the bottom (and in this way becoming more mechanically stable). Anyhow, prototyping requires me to electrically attach external components to the Arduino board, UNO, NANO, Leonardo, whatever board it is. Putting the NANO on the standard breadboards allow just two-hole rows on the bottom and three hole rows on top – practically just one row on each side on which to plant wires.

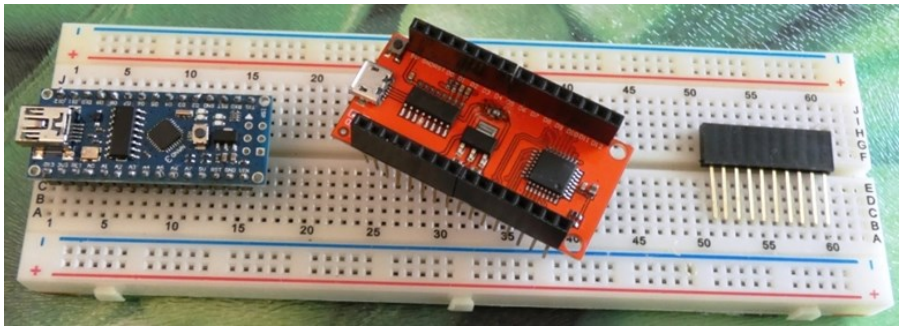
I noticed that many of my "experimental" temporary projects tend to be permanent (LOL), like a CTCSS generator I made and which I use every day. I design my own schematics and I write my own programs, even if I start from ideas belonging to others. The problem with making such projects permanent is that the back of the boards would end up sitting on my furniture/desk, not sliding, or damaging the surface they are on, and possibly touching other metallic surfaces.

I looked at the Arduino UNO and noticed that, although it is bigger, it has some advantages for testing/prototyping in comparison with NANO:

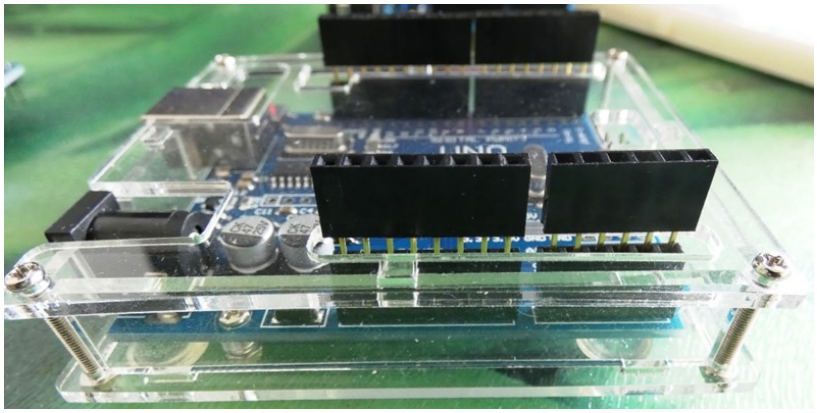
- It is almost the same price. I found it for 4.81 CAD instead of 4.30 CAD, as NANO would cost me – that is 11% more in all currencies.
- It has an additional power supply connector and power supply stabilizer on board, which would allow me to supply power from things other than a USB port.
- There are a variety of already made shields, cases and so on.

Paying even more, but just 1.50 CAD (=1.11 USD = 1.03 EURO = 21.61 ZAR) more than for an Arduino NANO board allows me to have the Arduino UNO board, together with a case, transparent or black. I have two types of cases, one with screws and one which does not require any screws, and is smaller.

The plastic case offers electrical protection to the board. It can also nicely sit on furniture without scratching. It also looks good, so I can build an Arduino shield project in several hours and play with it forever afterwards, because it already has a case.



Coming back to the prototyping shield kits that can be bought cheaply



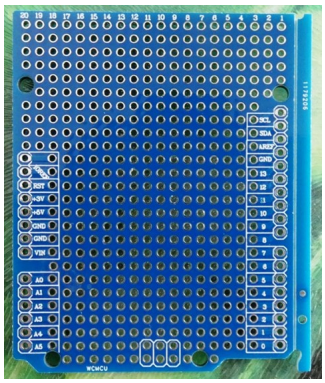
online, they contain the board, and the female connectors on top, with long male pins that can go through the board into the Arduino UNO board underneath. I immediately curb my enthusiasm here to write that if somebody wants to use Arduino UNO inside a case and the prototyping shield is on top, you have to intercalate more extender connectors, otherwise the electrical connection is not complete on all pins (I tried several times without extenders and failed every single time).

The kit contains only the board and one set of connectors/extenders, so an additional set must be bought.

The prototyping board itself is double sided perforated board. That means that if a component is soldered there, the chances of taking it out are very small. Those kinds of shields are mostly suitable for making demos and permanent/semi-permanent projects on them, after the hardware schematic is already established. I use them as a stable build on which I can trust there will be no flying wires, different than on breadboard tests. I can write the program, load, and verify it on board without worrying if I see mistakes and I continuously having to verify if the mistake is from my program or is due to a component or cable which by chance just got disconnected while handling the project. I find that the soldering space on the shield board is very small.

The board is double perforated, but it is a 3 -layers board. Inside the plastic there is a third layer, which makes the connection between the holes that will be soldered to the extender pins and the holes in the next rows. This is indicated on the shield, but I verified it with an ohmmeter.

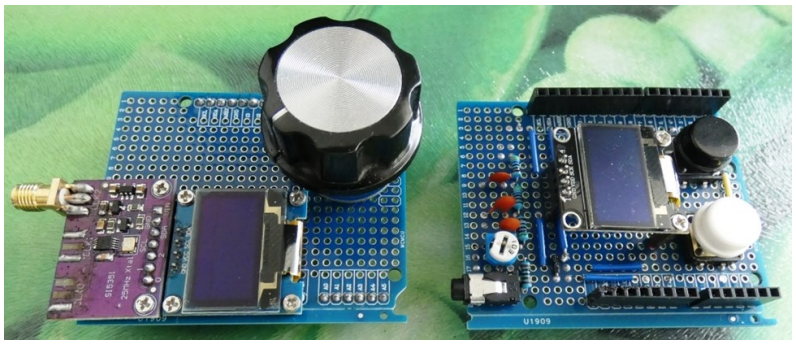
Keeping in mind the dedicated and unchangeable use of 4 rows of holes, there are just 14 rows of holes in the middle of the board.



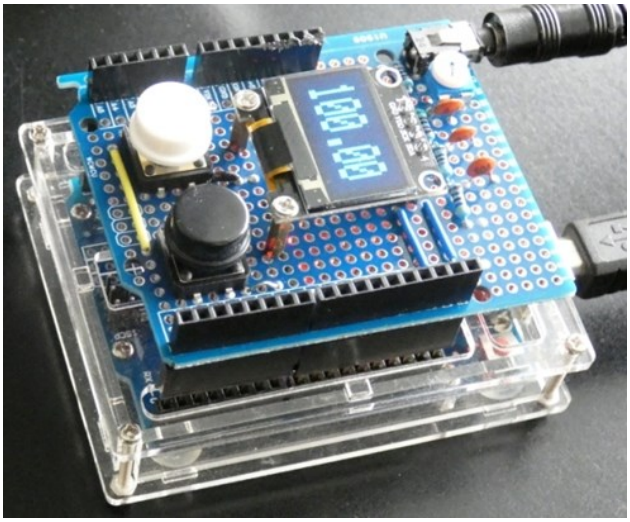
The free surface allows you to manually solder only a few things. Playing around, changing resistors and capacitors is not something that can be easily done.

I underline again that those prototyping shield kits are meant for projects that have an already established schematic.

In the next picture (below) I present two such shields populated by me. On the left side of the picture there is a signal generator with the module Si5351, an LCD display SSD1306 and a rotary encoder. I used only male pins because it is a very specialized shield, which cannot allow further extensions and use – at least not without compromising some of the initial purpose.



On the right side I used female extender connectors for a CTCSS generator. It uses two buttons (UP and DOWN) and an SSD display for showing the set of frequency which the generator can pass through. The UP and DOWN connectors are separately connected to two digital pins. The output passes through a filter and it is connected to a stereo audio jack soldered as MONO. I made this prototyping shield in such a way to possibly be used for other programs, not only CTCSS generation. An LCD display and two buttons can be used in many Arduino projects, can they not?



I just exemplified above how useful the prototyping shield can be, and several ways to use them.

Of course, one does not need to reinvent the wheel – when possible – and some pre-made Arduino shields can be bought for almost the same price as a bare bones prototyping shield kit.

One cheap and very well-known shield is the LCD1602 and buttons shield: Unfortunately, the buttons of this shield are cascaded, and the microcontroller has to compare some voltages given by the cascade of buttons in order to find out which button was pressed. I try to avoid this kind of arrangement and connect one button at one digital pin.

Other cheap shields are data loggers. This really requires some soldering if somebody wants to do it him/herself from zero, so I do prefer to buy it already made.

Prototyping shields are useful, and we are lucky the technology for Arduino has years of history now. Keep in mind the surface on one of these shields is very small. Soldering on double perforated bords is pretty much forever but has the advantage of being rock solid. Building shields one on top of the other may bring electrical interference and bouncing/ debouncing problems for buttons and rotary encoders. In combination with plastic cases for Arduino UNO the projects made on prototyping shields look nice, are mechanically solid, do not scratch the furniture and can be a permanent solution that you can attain in several hours of work. Something close to instant gratification, like my CTCSS encoder that I use with an old transceiver that does not do tones by itself.

~ Daniel VE7LCG

...more from

Daniel's Workbench

Digital Potentiometers

What is out there?

By DANIEL ROMILA VE7LCG

Daniel Romila VE7LCG looks at potentiometers, both analog and digital

When setting the volume of your TV louder or lower it is obvious, you no longer handle an analog potentiometer, but a digital one, since you push the UP or DOWN button on your remote (see note).

Note: actually, some stereo equipment with remotes have an electric motor coupled with the volume button, and one can see it rotating while pushing the UP or DOWN buttons; that electric motor can move either an analog, or a digital potentiometer. The first audio equipment having a remote control had only the capability to switch the equipment ON and OFF, and to push the volume UP or DOWN, which finally activated a motor coupled with an old type analog potentiometer.

But what about a stereo amplifier, radio, or your amateur radio transceiver? If it has a round button, how would we know if it is analog or digital?

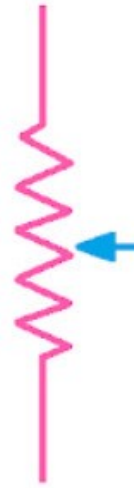
If you can turn and turn in any direction forever, without finding a physical limit, it is a digital one. Try it on the lower side, better than increasing the volume. At the same time, many of today's receivers have digital potentiometers for volume, but – if they still have – the front

potentiometers for bass and treble, they are usually analog.

This article is intended more as a hands-on approach towards using and designing hobby projects with digital potentiometers, whenever/if they are useful and simple to implement. A more technical article, with bits, computing and theory can be found at:

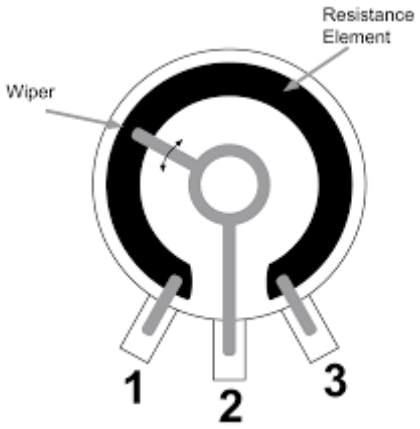
https://components101.com/articles/how-digital-potentiometer-works-and-how-to-use-it

As hobbyist, a potentiometer – any kind – is expected to give us access to at least 3 terminals *[left]*.



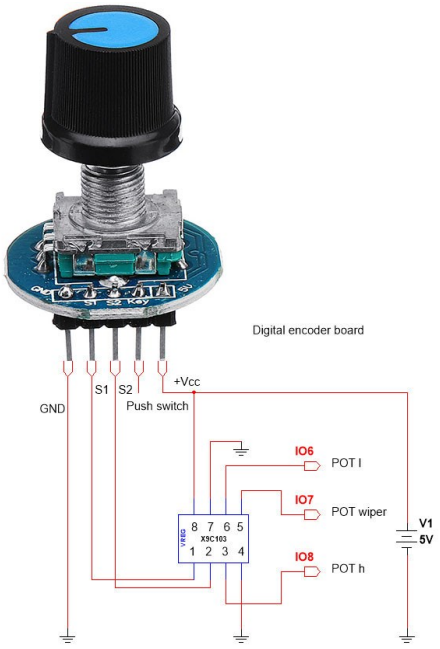
The middle one (blue) can be moved from one extreme to the other, and in this way the resistance between the wiper and that terminal can have any value between zero and the maximum that potentiometer was built for. There can be potentiometers with linear characteristic (the more we move the wiper, the more resistance we have, in a direct relation) and logarithmic potentiometers, where the resistance suddenly increases, not linearly, to match the logarithmic characteristic of human hearing. *(If we listen to music from speakers at 1W of power and afterwards pump 2W of power into the speakers we might notice just a very small increase, not double; we really need to increase the audio power 10 times, from 1W to 10W for our lazy ears to sense that the volume doubled – that is a logarithmic variation.)*

Somewhere above I wrote that the potentiometer has at least 3 terminals because some have more connections along the path of the total resistance track. And yes, in 2023 there still are analog potentiometers, and I do not think they will be totally gone soon.



We are used to saying that an analog potentiometer is noisy, and that a certain specific value can hardly be pinpointed at the same position each time, because it is of a mechanical construction.

To replace the analog potentiometer above, I have drawn and built a schematic based on a digital encoder EC11 and an integrated circuit, a dedicated digital potentiometer, X9C103.



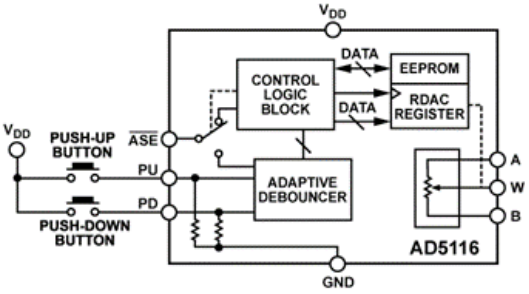
There is a whole family of digital potentiometers made by Renesas, for example:

- X9C102 = 1kΩ
- X9C103 = 10kΩ
- X9C503 = 50kΩ
- X9C104 = 100kΩ

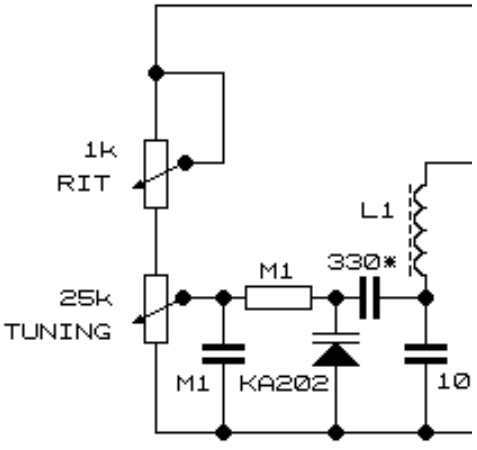
What you may notice from my schematic above is a mechanic device, EC11, that can be mounted on the chassis, and the actual potentiometer with terminals IO6, 7 and 8, that can be soldered wherever it is necessary, without worrying about long wires to the chassis, collecting noise and possible self-oscillation because the command from the potentiometer and the actual potentiometer are separate. All

these digital potentiometers need to be supplied power, like any integrated circuit.

There are integrated circuits like AD5259 and DS1844, that require a microcontroller to use them. There are integrated circuits like AD5116 that have just an UP and a DOWN button outside, without a digital encoder.

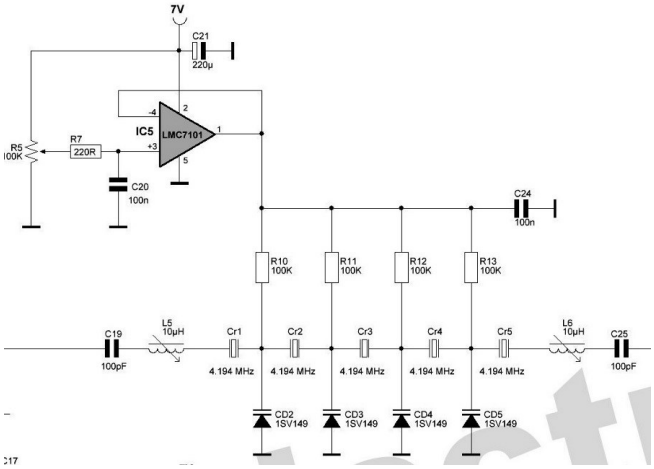


Apart from having linear or logarithmic characteristic, it is important to know the number of steps a digital potentiometer can give us. An analog potentiometer, being 10 KOhm can provide any resistance between its wiper and its extreme terminals, between 0 and 10 KOhm. A digital potentiometer cannot do that. It will provide a limited set of values, spread between 0 and 10 KOhm. For example, the integrated circuit I used in my schematics, X9C103 can provide only 100 values, equally spread between 0 and 10 Kohm.



That means that if we use a digital potentiometer for a VFO (variable frequency oscillator) controlled by a varicap diode (which varies its capacitance with the applied voltage) we will obtain a set of frequencies inside the band we want, but we cannot get any frequency we might want. So, it is up to the hobbyist to take in consideration if the number of steps is enough to give the illusion of continuous coverage of the desired interval of frequencies. One hundred values might be enough for controlling an oscillator between 455 KHz and 457 KHz.

It might also be enough to adjust the selectivity of a ladder crystal filter, also with varicap diodes, like in the schematics I found a long time ago at RH Electronics (although the link no longer works).

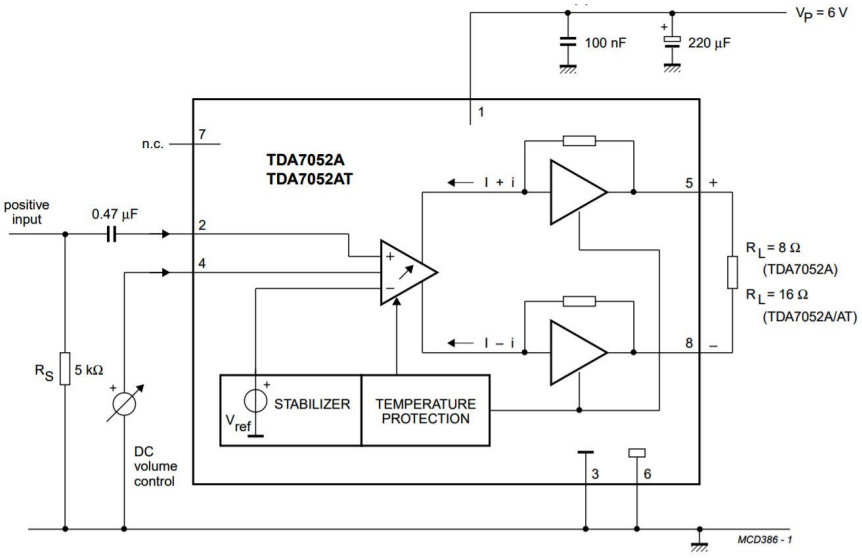


One immediate use of a digital potentiometer, in audio, would be for direct conversion receivers. No more worries about the long wires for the audio potentiometer to the chassis. Since a direct conversion receiver has the sensitivity dictated by very large audio amplification, such big amplification poses self-oscillation problems, and it does not like big mechanical elements like potentiometers, which can radiate around and cause capacitance parasitic coupling, and would require wires for a connection.

Some audio integrated circuits already offer us the possibility to separate the volume control from the audio path, and not to insert a potentiometer in the audio path at all, neither analog nor digital. This is because those integrated circuits, like TDA7052 (with

a DC volume control) have a separate pin where we can connect a variable voltage, obtained with a potentiometer (whatever kind of potentiometer) to control the amplification.

~ *Daniel VE7LCG*



…more from

Daniel VE7LCG is our most prolific contributor. Here is an index of his previous articles in case you would like to go back to look them up.

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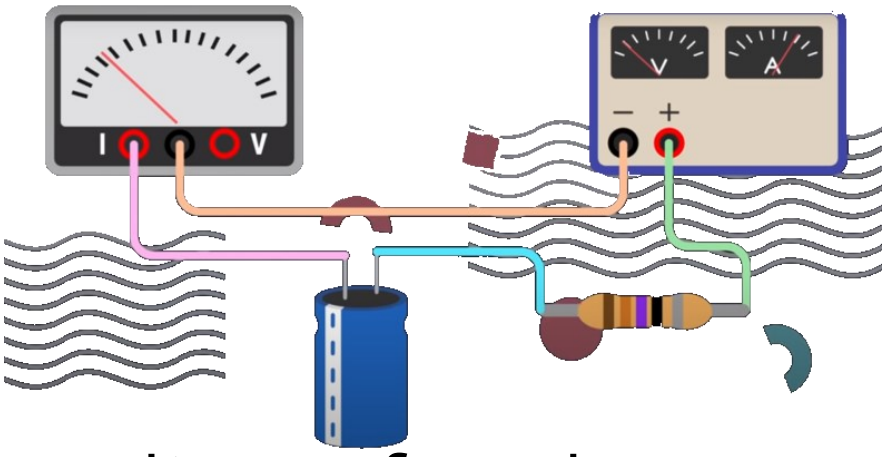
Protect vintage gear with easy capacitor reforming



By HACKADAY / DAVE ROWNTREE

Hackaday
Original Article:
[Protect Vintage Gear With Easy Capacitor Reforming | Hackaday]

Having acquired some piece of old electronic equipment, be it a computer, radio, or some test gear, the temptation is there to plug it in as soon as you've lugged it into the 'shop. Don't be so hasty. Those power supplies and analog circuits often have a number of old aluminium electrolytic capacitors of unknown condition, and bad things can happen if they suddenly get powered back up again. After a visual inspection, to remove and replace any with obvious signs of leakage and corrosion, those remaining may still not be up to their job, with the oxide layers damaged over time when sat idle, they can exhibit lower than spec capacitance, voltage rating or even be a dead short circuit. [TechTangents] presents for us a guide to detecting and reforming these suspect capacitors to hopefully bring them, safely, back to service once more.

When manufactured, the capacitors are slowly brought up to operating voltage, before final encapsulation, which allows the thin oxide layer to form on the anode contact plate, this is an electrically driven chemical process whereby a portion of the electrolyte is decomposed to provide the needed oxygen ions. When operating normally, with a DC bias applied to the plates, this oxidation process — referred to as 'self-healing' — continues slowly, maintaining the integrity of the oxide film, and slowly consuming the electrolyte, which will eventually run dry and be unable to sustain the insulating oxide layer.

If left to sit un-powered for too long, the anodic oxide layer will decay, resulting in reduced

operating voltage. When powered up, the reforming process will restart, but this will be in an uncontrolled environment, resulting in a lot of excess heat and gases being vented. It all depends on how thin the oxide layer got and if holes have started to form. That is, if there is any electrolyte left to react – it may already be far too late to rescue.

If the oxide layer is sufficiently depleted, the capacitor will start to conduct, with a resultant self -heating and runaway thermal decomposition. They can explode violently, which is why there are score marks at the top of the can to act as a weak point, where the contents can burst through. A bit like that 'egg' scene in Aliens!

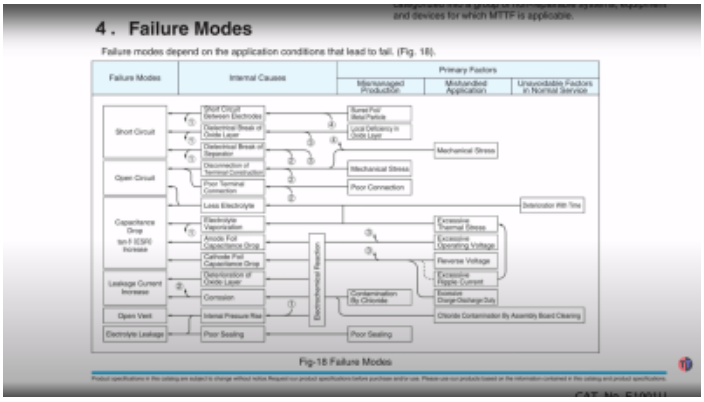
The 'safe' way to reform old capacitors is to physically remove them from the equipment, and apply a low, controlled voltage below the rated value to keep the bias current at a low value, perhaps just 2 mA. Slowly, the voltage can be increased to push the current back up to the initial forming level, so long as the current doesn't go too high, and the temperature is within sensible bounds. The process ends when the applied voltage is at the rated value and the current has dropped off to low leakage values.

A word of warning though, as the ESR of the reformed caps could be a little higher than design, which will result in higher operating temperature and potentially increased ripple current in power supply applications.

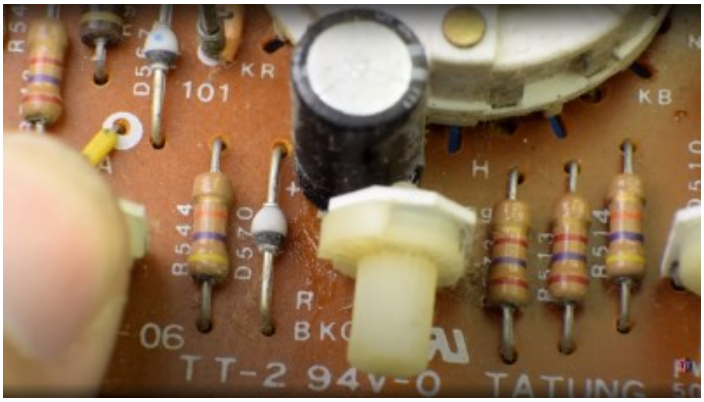
We're really glossing over this subject fast here, but [TechTangents] was kind enough to link to some fine capacitor-related reading for those who need a primer. Here is a US DoD handbook for reforming capacitors with advice on storage shelf life, some tech notes on using electrolytic capactors from chemi-con, and a general capacitor guide from TDK. Reforming caps is nothing new, here's an previous article about repairs, and something a bit more recent.

Thanks [Jimi] for the tip!

~ Hackaday / Dave Rowntree



Capacitor failure modes are plentiful .



Yucky leaky capacitor.
Replace these! and clean-up that conductive goo too.

Harvesting rechargeable batteries

from single-use devices

By HACKADAY / BRYAN COCKFIELD

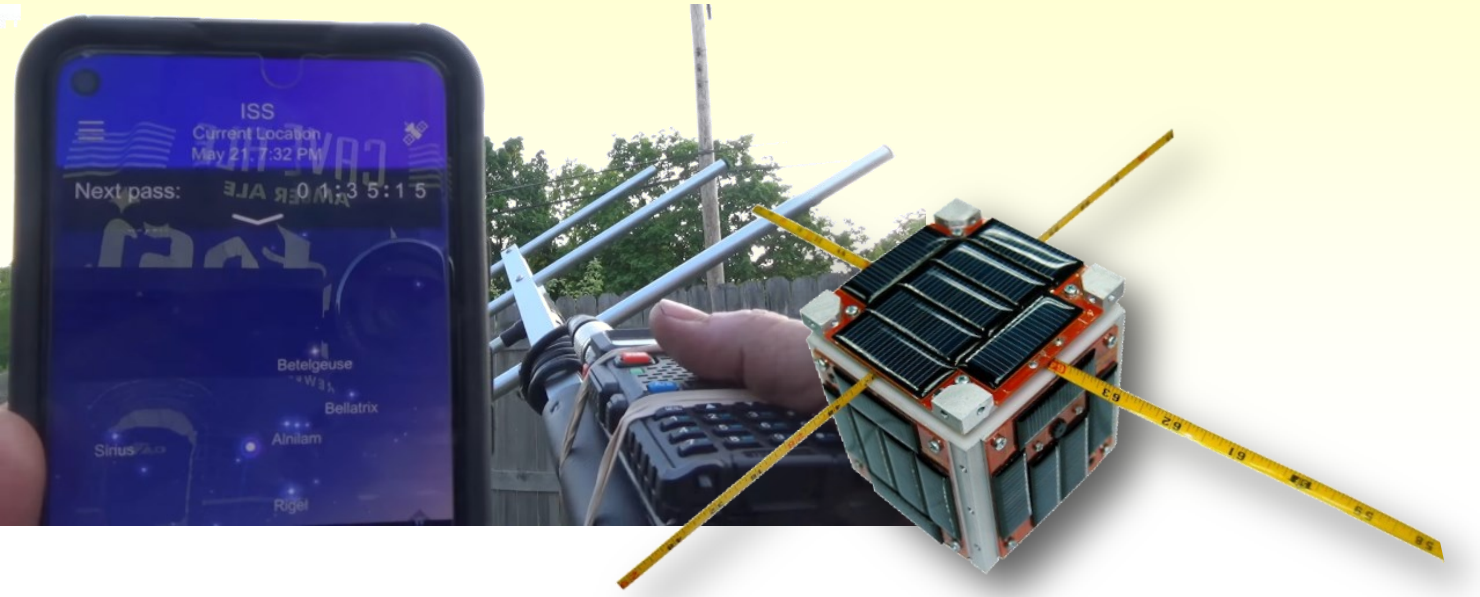
Hackaday
Original Article:
Harvesting Rechargeable Batteries From Single-Use Devices | Hackaday

The price of lithium batteries has plummeted in recent years as various manufacturers scale up production and other construction and process improvements are found. This is a good thing if you're an EV manufacturer, but can be problematic if you're managing something like a landfill and find that the price has fallen so low that rechargeable lithium batteries are showing up in the waste stream in single-use devices. Unlike alkaline batteries, these batteries can explode if not handled properly, meaning that steps to make sure they're disposed of properly are much more important. [Becky] found these batteries in single-use disposable vape pens and so set about putting them to better use rather than simply throwing them away.

While she doesn't use the devices herself, she was able to source a bunch of used ones locally from various buy-nothing groups. Disassembling the small vape pens is fairly straightforward, but care needed to be taken to avoid contacting some of the chemical residue inside of the devices. After cleaning the batteries, most of the rest of the device is discarded. The batteries are small but capable and made of various lithium chemistries, which means that most need support from a charging circuit before being used in any other projects. Some of the larger units do have charging circuitry, though, but often it's little more than a few transistors which means that it might be best for peace-of-mind to deploy a trusted charging solution anyway.

While we have seen projects repurposing 18650 cells from various battery packs like power tools and older laptops, it's not too far of a leap to find out that the same theory can be applied to these smaller cells. The only truly surprising thing is that these batteries are included in single-use devices at all, and perhaps also that there are few or no regulations limiting the sale of devices with lithium batteries that are clearly intended to be thrown away when they really should be getting recycled.

~ Hackaday / Bryan Cockfield



Listening to the ISS on the cheap

By HACKADAY / DAN MALONEY

Hackaday
Original Article:
Listening To The ISS On The Cheap | Hackaday

Like any hobby, amateur radio has no upper bounds on what you can spend getting geared up. Shacks worth tens of thousands of dollars are easy to come by, and we'll venture a guess that there are hams out there pushing six figures with their investment in equipment. But hands down, the most expensive amateur radio station ever has to be the one aboard the International Space Station.

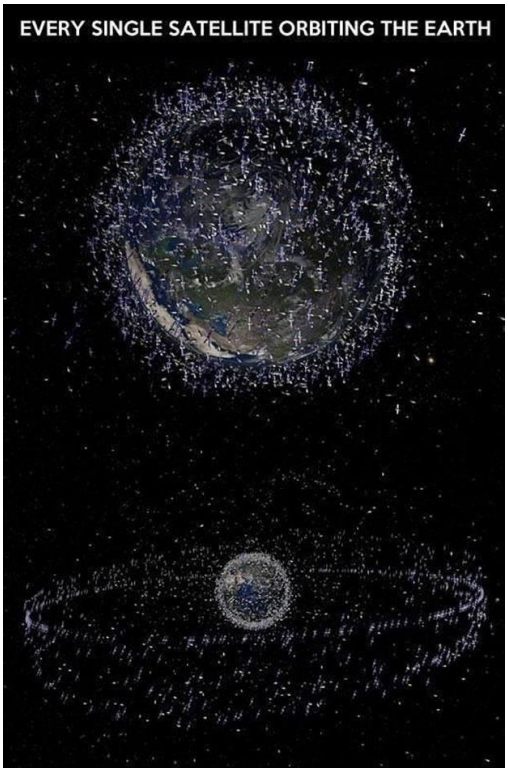
So what do you need to talk to a $100 billion space station? As it turns out, about $60 worth of stuff will do, as [saveitforparts] shows us in the video below. The cross-band repeater on the ISS transmits in the 70-cm ham band, meaning all that's needed to listen in on the proceedings is a simple "handy talkie" transceiver like the $25-ish Baofeng shown. Tuning it to the 437.800-MHz downlink frequency with even a simple whip antenna should get you some reception when the ISS passes over.

In our experience, the stock Baofeng antenna isn't up to the job, so something better like the Nagoya shown in the video is needed. Better still is a three-element Yagi tuned down slightly with the help of a NanoVNA; coupled with data on when the ISS will be within line-of-sight, picking up the near-constant stream of retransmissions from the station as Earth-based hams work it should be a snap — even though [saveitforparts] only listened to the downlink frequency here, for just a bit more of an investment it's also

possible for licensed hams to uplink to the ISS on 145.900 MHz.

For those who want a slightly higher level of difficulty, [saveitforparts] also has some tips on automating tracking with an old motorized mount for CCTV cameras. Pitchfork notwithstanding, it's not the best antenna tracker, but it has promise, and we're eager to see how it pans out — sorry. But in general, the barrier to entry for getting into space communications is so low that you could easily make this a weekend project. We've been discussing this and other projects on the new #ham-shack channel over on the Hackaday Discord. You should pop over there and check it out — we'd be happy to see you there.

~ Hackaday / Dan Maloney



Right: click on the graphic

The inspiring path of Silvana, the Cordoba YL who is an air evacuation nurse

Since she was a child, an interest in mountains awoke in her. With her grandfather, she took long walks at the foot of the mountains, where she learned to hunt, fish and swim. But what most caught her attention were those peaks that were seen in the distance from her; And of course, getting to the top was not an easy job, much less a short one. Twenty-six years have passed since that first time she turned on a light of hope to be able to fulfill the goal she so desired: to reach the top.

Silvana Patricia Candiani Marcuzzi LU9XBP, age 44, native of the Cordoba capital, is a rescuer and air evacuation nurse. Her perseverance led her to Switzerland, where she was awarded a scholarship to train alongside one of the world's most prestigious alpine helicopter rescue companies. On May 30, she began a course in that country, an experience that certified her to provide emergency helicopter medical services in extreme conditions.

However, the path to reach the foot of the Swiss Alps to live that experience began a long time ago, in 1997. For Silvana, climbing a mountain, however imposing, did not simply mean reaching the top. Her dream encompassed much more. She took time, she experienced frustrations, fears and uncertainties; a path forged based on trial and error.

"I already knew that I wanted to be a mountain rescuer before finishing high school," said the woman in dialogue with The voice. Although she was clear about what she wanted, she took a different course and decided to study Electronic Engineering, which "was a failed attempt in several aspects," she recounted.

"We all know that a rescue involves communication in all its forms and, according to me, putting antennas on the mountains was a great way to start my profession as a rescuer. But obviously it wasn't there, and it was frustrating. The first big frustration. Discovering that this was not for me and accepting that I was not going to be able to achieve it in a timely manner, "explained Patricia.

Despite the fact that at first glance it seemed that time had been wasted, something was beginning to be built and the path was gradually clearing. "In Argentina, rescue does not exist as a profession. One cannot officially 'study' rescue, so I put together a strategic plan, and not without doubts, fears and distrust, "she recounted.

In 1997 the first mountain survival course began. At that point, she began to find some indications that her dream could come true. Silvana continued her formation with unwavering determination, always keeping her goal in her sight.

Although she failed to complete some of her chosen careers, they all played a vital role in her professional growth. For more than two and a half decades, she trained as a tour guide, mountain guide, radio amateur, medical expert, lifeguard, first aid specialist with the Red Cross, Wilderness First Responder (WFR), nurse, kinesiologist, and many others. disciplines.

In turn, "from a very young age, she worked on everything she considered would give her the chance to grow as a rescuer, sometimes with success and other times not so much. Although everything helped to demarcate the path, which did not exist, "she said.

It is a story that embodies resilience, perseverance, overcoming, the idea of restlessly waiting for the opportunity, of charting a course so that dreams become goals.

And at the heart of it all is the transformative power of education, which enables you to climb the mightiest mountains and pursue your dreams, no matter how long it takes.

~ *QRZ/W0PV*

Around the GOTA Corner

I'm a klutz

Larry Bloom VE7LXB is a Director and the 'New Ham Coordinator' for Surrey Amateur Radio Communications

By LARRY BLOOM VE7LXB

When it comes to fixing stuff, I usually don't. I avoid assembling Ikea furniture, changing flat tires, or installing ceiling fans. I've been this way my whole life. I'm still haunted by the lamp I made in shop class. My mom thought it was a soup spoon. So, it's not surprising I feel inferior when it comes to ham radio.

I've tried soldering but it seldom ends well. Messy. Unfinished. As our club's New Ham Coordinator, I'm terrified a novice will want my help installing Anderson Powerpoles (I can smell the smoke already.) Other hams, it seems, can fix a nanoVNA over coffee.

Oh sure, I own numerous handhelds and an all-mode transceiver. I log onto 2m nets, enter HF contests, and join Fox Hunts. But an Elmer had to finish my j-pole! (Not a total loss, he's proud of his work.) Yesterday, I told my wife that I'll be stringing wire on my POTA activation, and she almost fainted.

I have a tool kit in my shack, coils of coax in my trunk, and a dozen fuses taped to my IC 7000 (it's the apocalypse, stupid.) But I feel like a kid who sports a pocket protector because he wants to look smart.

Is there hope for me? Am I alone?

73,

~ Larry VE7LXB

ve7lxb@gmail.com

The unseasoned ham

I'm pleased to report that our GOTA initiative is exceeding expectations. Demand for our June 3rd morning **workshop** was high and required the addition of a 2nd afternoon session. After Horace VA7HXB programmed participant radios, eighteen new hams were instructed in basic HT usage, the ABCs of repeater and simplex frequencies, and VHF antenna options. They learned how to initiate contact using on-air etiquette and standard jargon. We also touched on contesting, Elmer availability, and survival communications. The workshop concluded with a mock net intended to help the newbs get past mic fright. I should mention that there were several hams from the previous March workshop assisting with the workshops. Pay it forward, as they say.

Our GOTA Net continues its popularity with new and unseasoned hams. Every Thursday evening at 8pm we take check-ins, then discuss ham topics and updates on personal progress in our Round Table. Participants are encouraged to ask for help from the designated Elmers who have logged in.

The three choke points for new hams appear to be:

- Entry-level radios with rubber duckies that aren't up to the task.
- A lack of understanding as to how to program radios for repeater activation.
- Mic fright.

Our GOTA mission at SARC is to help newbies overcome these challenges. Recently, we have begun reaching out to past course graduates with an invitation to our workshops and the GOTA Net.

That's all for now. In my next GOTA Corner I will report on GOTA's successful involvement in this past Field Day.

My email is GOTA@ve7sar.net

73,

~ Larry VE7LXB
New Ham Coordinator
Surrey Amateur Radio Communications

Ham Radio

Outside the box

Has POTA Become a

A recent TechTalk on contesting...

John Corby VA3KOT is a Canadian amateur radio operator based in Owen Sound, Ontario. He holds an Advanced certificate and is passionate about two things: operating outdoors and CW.

By JOHN CORBY VA3KOT

Parks On The Air (POTA) may have started out as a fun way to get outside into the Big Blue Sky Shack and play radio, but now it has become very competitive. Those who like to take a casual approach to activating parks can still enjoy their hobby their way, but others have a different, more intense approach.

At a recent TechTalk on contesting at my club (Georgian Bay Amateur Radio Club in Owen Sound ON) the presenter talked about POTA being "like a contest". There is a leaderboard based on number of activations and number of QSOs at each park. Almost every one of my own activations has involved intense pile-ups just like in a contest. At almost every unactivated park (aka ATNO: All Time New One) there is a race to be the first to activate it.

For the very dedicated there are the positions of "Top Activator" and "Top Hunter" to compete for. You have to be very dedicated indeed to vie for those honours. That's major league. I'm keen but in the peewee class.

A Wild Rover?

The POTA organization has a "Rover" award for activating five or more parks in a day. Personally I have never activated more than three, and even then two of them were at a "two-fer" – a point that lies within two parks so that the

same set of QSOs can be claimed for activating each of the two parks.

Only 10 QSOs are required for a valid activation, but who stops at just ten? I have logged the minimum in as little as nine minutes on more than one occasion. I generally go on to make 20, 30 and even 50 or more QSOs before calling it a day. If one is competing for a Rover award, there is an incentive to call QRT early and move on to the next park. Rush, rush, time is of the essence!

One a Day – Every Day!

Hams have been known to attempt – and succeed – at activating at least one park every day for a full year. If you have ever experienced the intensity of an event like the ARRL Field Day, then imagine doing that every day for a year through wind and rain and snow and ice.

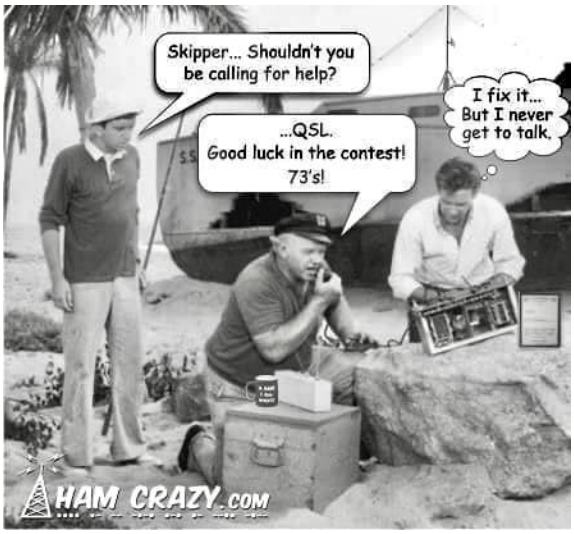
The competitive bug does tend to infect many of us who enjoy activating. I often find myself checking the leaderboard for parks I have activated. How is my QSO count lead holding up? Has anybody activated the park more often than I have? QSO counts are cumulative. If you activate the same park multiple times your QSO count for that park steadily builds.

Very Leisurely, No Pressure – What?

This is the first year in which I have activated parks during the winter. In previous years it was purely a summer activity – usually done while camping. Very leisurely, no pressure. This year I ventured out to a local park while there was deep snow on the ground. I wore snowshoes and pulled my gear on a sled. I posted some pictures of the activation on the POTA Slack forum and received the comment: "That's wanting to POTA bad my brother!"

Just a few years ago my forays out into the Big Blue Sky Shack often yielded no QSOs at all, nada, zip. The consolation was the "fun" of throwing wires into trees and eating up battery amp-hours while enjoying the great outdoors. And then along came POTA and it became addictive. Yes, I want to POTA bad brother!

~ John VA3KOT



John VA3KOT resides in Owen Sound, Ontario but is more often found operating CW out in the "Big Blue Sky Shack". He especially enjoys activating parks for the POTA program and blogging about his experiences at HamRadioOutsidetheBox.wordpress.com

By: REG NATARAJAN VA7ZEB

Reg Natarajan VA7ZEB describes himself as Just another middle aged expat splitting his time between Canada and South America.

I gave the go-bag a workout today at the SARC OTC in South Surrey. I had tested it from my place but I can hit everything from home. I wanted to test it from somewhere that has trouble with most local repeaters.

The setup is simple: Small and cheap mobile radio (QYT W12 $120), Lithium iron phosphate battery (TalentCell $80), Collapsible aluminum J-Pole (SignalStuff $100), Tall (72") tripod and quick-release bracket designed for DSLR cameras (Neewer $100), Waterproof fishing rod bag (AliExpress $50).

Everything in the photo fits into the 70 cm bag, which I then hang on the tripod as a base for the radio. Setup/teardown takes under 5 min, aided immensely by the quick-release bracket.

Results were spectacular, with me being able to easily hit all the North Shore repeaters and even a couple of repeaters out on Vancouver Island, none of which is possible with a smaller antenna. Signal reports were generally excellent. This setup outperformed the Yaesu FTM-300 mounted in my car with a quarter-wave mag-mount.

Comments:

- Keeping a 30' line of coax in the bag would give me the option of sitting far away from the antenna and operating more comfortably. It would also let me place the bag in the base of the tripod for additional stability in windy conditions. I've already ordered one from Amazon. I will leave the current cables in the bag in case I want to operate as shown in the photo.
- Some plastic ground spikes might also be a good idea for stability, although they obviously wouldn't have helped in the parking lot where I did my tests. (EDIT: Ordered from Amazon $14.)
- The radio body (a small black box) gets hot inside the bag. Some velcro ties to strap it to the tripod would be a good idea.
- Everything in the bag is of high quality except the radio, which is crap, but I am not comfortable buying an expensive Japanese radio for a bag that (hopefully) will almost never be used outside field day.

  The bag is pretty heavy at 4.5 kg (10 lb) but I'd rather accept that weight than sacrifice anything inside.

Overall, I'm completely satisfied, but ideas and feedback are welcome.

~ Reg VA7ZEB

Satellite Optimized Amateur Radio

A look at what is available

by THOMAS WITHERSPOON K4SWI / VY2SW

If you've been listening to the Ham Radio Workbench Podcast, you've no doubt heard Mark Smith (N6MTS) talk about his "secret squirrel" project. At BayCon 2022 this past weekend, Mark revealed that the "secret squirrel" is a new product he's designed called SOAR (Satellite Optimized Amateur Radio).

Mark announced that SOAR is basically a radio that's "optimized for operating FM satellites."

That's a very modest description for a radio that can not only handle full duplex FM satellite communications, but also leverage the power of a GPS and CPU to help predict passes, aim an antenna, and adjust for doppler shift on the fly. And, oh yeah, it even records.

SOAR actually does much more than this.

If full duplex satellite work is the sort of thing that interests you, I highly recommend watching Mark's BayCon presentation:

Click here to view on YouTube.

You can learn more about SOAR at:

- https://electronics.halibut.com/SOAR/
- https://twitter.com/HalibutElec

The Halibut Electronics website has only recently been launched, so there's not a lot of info there at time of posting. For the latest news, I suggest you follow Mark on Twitter at: https://twitter.com/SmittyHalibut

Of course, I'll post updates here on QRPer.com.

Note this presentation was originally given at BayCon 2022: https://www.bay-net.org/baycon.html

~ Thomas K4SWI/VY2SW

Thomas Witherspoon VY2SW / K4SWL is active in QRP in both the United States and Canada.

Is RG-8X the general purpose coaxial cable?

Someone suggested RG-8X

by BOB WITTE K0NR

Bob Witte K0NR maintains a great blog site at https://www.k0nr.com/wordpress/

While doing a presentation about choosing the right coaxial cable, someone suggested that RG-8X (also called "Mini 8") might be the best general-purpose cable for amateur radio. There is a lot to like about RG-8X. It is about 1/4-inch in diameter, and is flexible and affordable. This comment made me realize that I default to a larger cable (LMR-400 or RG-8) for everyday use and consider RG-8X as the cable for lightweight, portable applications (such as SOTA and POTA). But perhaps I am underestimating the capabilities of RG-8X.

So let's take a look at the specs on RG-8X, using the DXEngineering RG-8X datasheet. Other manufacturers of RG-8X will have similar specs.

Power Rating

Most general-purpose amateur radio operation occurs at power levels of up to 100 watts for frequencies of 3 MHz to 54 MHz and up to 50 watts from 144 MHz to 450 MHz. I am thinking in terms of a station that has a 100-watt radio for HF and 6m and a typical 50-watt FM dual-band radio for 2m and 70 cm.

These power levels are easily handled by RG-8X. In fact, the cable is spec'd for over 1 kW for all of the HF bands. At 50 MHz, the power rating drops to 900 watts

and further reduces to 400 watts at 150 MHz. DX Engineering does not specify the power at 440 MHz, so I looked at other websites and found that the power rating drops off to about 100 watts. So power handling is not going to be an issue *[see table right]*.

Attenuation/ 100 ft.	Power Rating	Efficiency %
0.65 dB @ 5 MHz	3.0 kW	86 %
1.0 dB @ 10 MHz	2.2 kW	79 %
1.5 dB @ 30 MHz	1.2 kW	70 %
2.3 dB @ 50 MHz	0.9 kW	59 %
3.8 dB @ 150 MHz	0.4 kW	42 %

Signal Loss

Signal loss may be a more significant limitation. How much loss are we going to be comfortable with? That is difficult to answer because each of us may make different tradeoffs to accomplish our radio operating objectives. As an upper bound, I hate to see the cable loss go as high as 3 dB, which corresponds to losing half the power in the cable! But living with 1 dB might be acceptable, which is 20% power loss. So let's use that.

(Someone reading this is thinking: 3 dB is only half an S-unit, it won't matter that much. To which I say: it won't matter unless you are operating near the noise floor and 3 dB is enough loss to have your signal disappear.)

The table above shows the loss in dB per 100 feet. At 100 feet, the loss creeps up to 1.5 dB at 30 MHz. Let's stretch our 1 dB rule of thumb to 1.5 dB, which means the loss is reasonable for all the HF bands using a 100-foot cable. At 50 MHz, the loss increases to 2.3 dB/100 feet, so to stay within 1 dB or so, we would need to limit our cable length to 50 feet. At 150 MHz, the loss rises to 3.8 dB/100 feet so we should keep our cable length less than about 25 feet. We don't have a spec for the loss at 450 MHz but checking other websites reveals a typical loss of 6.6 dB/100 feet at 400 MHz. A 25-foot cable at 450 MHz will have a little over 1.6 dB loss.

So now the problem becomes clear: signal loss at high frequencies will be the limiting factor. (This is why I tend to grab a larger cable because I'm often operating above 50 MHz.)

Conclusions

So what can we conclude in very broad terms? Is RG-8X a good choice for a "general purpose" coaxial cable? I am going to say "Yes, But." The key issue is signal loss and that is driven by the frequency being used and the length of the cable. So YES, RG-8X is a good general-purpose coaxial cable BUT watch out for signal loss and cable length on the higher bands.

Here's my Rules of Thumb for this cable:

For HF, RG-8X is great for all bands with cable lengths up to 100 feet (maybe longer).

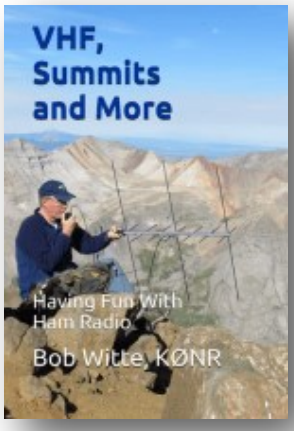
For 6m, RG-8X is good with a cable length of up to 50 feet.

For 2m and 70 cm, RG-8X is good with a cable length of up to 25 feet.

In all cases, checking the manufacturer's specs and doing your own calculations is recommended. For a slightly deeper look at coaxial cables, see Hey, Which Coaxial Cable Should I Use?

~ 73 Bob KØNR

Check out Rob's book VHF, Summits and More: Having Fun With Ham Radio.



This book is an easy-to-understand introduction to VHF/UHF ham radio, including practical tips for getting on the air and having fun messing around with radios. Learn about FM, SSB, repeaters, equipment, band plans, phonetics, portable operating, Summits On The Air (SOTA) activations and more.

Ever Heard Of Heathkit's SS-8000 Digital Transceiver?

…Me neither!

By STEVE McDONALD VE7SL

Steve McDonald VE7SL Reproduced with the author's permission, Visit The VE7SL Radio Notebook at: The VE7SL Radio Notebook and Steve's blog at VE7SL - Steve - Amateur Radio Blog

Courtesy N8RS

The Heathkit SS-8000 was a unique synthesized HF transceiver (160-10m) originally designed as a kit in 1978. The reason that very few hams have heard of it is that it was never released … and only three were ever prototyped!

Robert Sumption, N8RS, is an ex-Heathkit engineer who worked on the project back in the late 70s. He recalls that after evaluating the project, it was deemed too complicated to be offered as a kit, since once built, most builders would not have the test equipment needed to align it properly. Consequently all three units were dissembled and sent to a local scrapyard!

Fast forward to 2015 when Bob came across all of the boxes of 'scrap' that someone had rescued from the scrapyard back in the day and the entire pile was now selling on eBay.

Would the SS-8000 live to meet it's intended destiny? Bob describes this very challenging project in his six 5-minute videos.

Part 1:

https://m.youtube.com/watch?v=1uWgiToLEsE

Part 2:

https://m.youtube.com/watch?v=-bjbVBgWXBU

Part 3:

https://m.youtube.com/watch?v=Bzhj7zAJ4Zo

Part 4:

https://m.youtube.com/watch?v=r_grn4WIHCI&t=3s

Part 5:

https://m.youtube.com/watch?v=4NXpRIJHlZw

Part 6:

https://m.youtube.com/watch?v=_rI423emQz4&t=56s

I hope you find the videos as interesting as I did. It seems that Bob has some terrific skills and a lot of patience!

~ *Steve VE7SL*

In case you didn't know ...

4 cans of beer or soda (12 oz) stacked together are 19 inches tall, and will resonate on 2 meters.

12 cans stacked together are 57 inches tall and will resonate on 6 meters, as well as a 3/4 wave on 2 meters.

A case should be good for CB/11M ... drink up and start building those antennas.

VE9KK

Here we go again...

My Icom 7610 was shutting down and restarting

By MIKE WEIR VE9KK

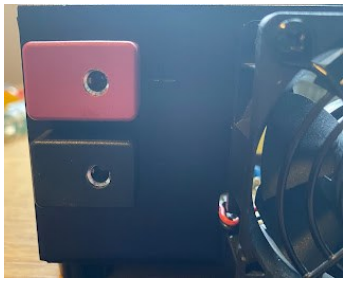
Mike Weir VE9KK was first licensed in 1989 and upgraded to advanced in 2000. He primarily operates contests both CW and RTTY.

September last year I had an issue with my Icom 7610, it was shutting down and restarting. The issue was a supply low voltage situation. With the 7610 if the incoming voltage drops below 11.44 volts the radio turns off. This voltage drop happens during transmit (CW in my case) then the radio cycles off, the current draw stops and the voltage goes back up and the radio cycles back on again. This is a normal situation with the 7610 and is supposed to happen with a voltage drop at or below 11.44 volts DC. In my last post when this happened in September 2022 I narrowed it down to the Anderson power pole connectors for more details click the "In my last post link above.

On Wednesday I was taking part in the 1-hour CWops mini contest and out of the blue while transmitting my 7610 cycled off and then on again. I thought "Here we go again". I had a good idea where the problem was and to finish the contest I lowered my power from 100 watts to 50 watts. I have the Astron SS-30M power supply and for some reason beyond me, Astron decided to use screw-down terminals to connect your radio DC cables. It is a small slotted screw and to me just a problem waiting to happen. My old Astron power supply had studs with nuts and made a very solid connection. There is a new version of the Astron SS

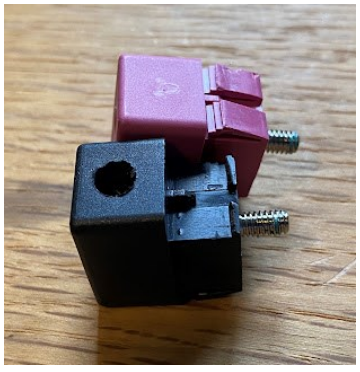
-30 and it offers Anderson connections on the front. But the screw type connections are still present on the back of the supply.

I decided it was time to do 2 things remove the inline automobile fuse holder and fuse on both the DC positive and negative radio cables supplied by Icom. It has been documented many times how these fuse holders have caused issues with voltage drop due to a poor connection over time. The other thing was a bit more ambitious which was to remove the screw-down positive and negative terminals on the Astron power supply. They were to be replaced with studs and nuts for a solid connection.



Old screw terminals

The Astron power supply is out of warranty as for sure doing this mod would certainly void the warranty. So lets get started....The screws fastening on the cover of the power supply are Torx-type screws and you will need the proper tool to get the cover off. Once the cover was off I removed the positive and negative cables from the back of the screw-type connectors. These 2 connectors were removed from the power supply and put in their proper place… the garbage!

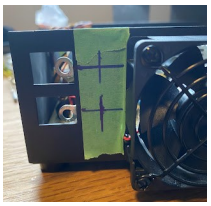


Out to the trash!

Two holes now had to be drilled in the case for the new studs and this is where success and disaster are a very fine line from one another. I placed tape on the inside and outside of the case as fewer filings from the drilling make their way into the power supply case. I also placed some protection on the inside of the power supply to also catch filings. I then marked off the holes and I used 3 drill bits to slowly move the hole up to the 3/8 size I was looking for. A word about the drill bits, I put a large amount of tape around the bit where I wanted it to stop once the hole was completed. No matter how good you are once that drill bit makes it way through the metal case it is going to want to keep going. You have a lot of pressure on that drill and well no one's reflexes are that good. I use the tape as a drill stop and it worked just fine as no damage was done to the parts in the power supply.

Drill bits

I used fibre inserts in the holes to insulate the studs from the case. These came from my other 20 amp Astron supply which are now on order from Astron. Then with the studs temporarily installed (no wires attached), I did a continuity check to ground and all was good, now the negative stud eventually does connect to ground and really does not matter but for poops and giggles I did it anyway.



Marked and ready to go

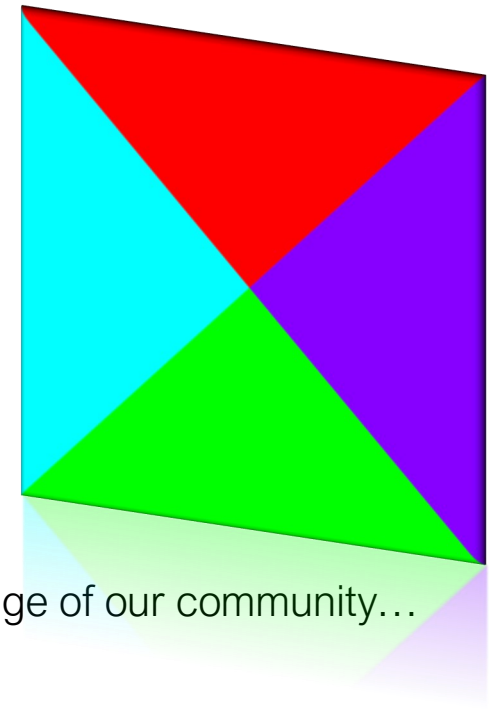
I now connected the internal positive and negative wires to the studs and secured them. I then did the smoke test by turning on the power supply… all went well or this would be a much different blog post! I then tested the voltage at the Astron power supply new stud terminals and it was 13.86 VDC, then the cover when back on. I then added ring terminals to the Icom power cables (less the inline fuses and more on that in another post)

When I powered the Icom radio up and looked at the onboard voltage meter was reading 13.6 volts DC and during transmit using an FT8 carrier (into a dummy load) the voltage only dropped to 13.12 volts DC which is a great improvement.

Finished product

~ Mike VE7KK

Foundations of Amateur Radio



Considering the language of our community…

By ONNO BENSCHOP VK6FLAB

Onno Benschop
VK6FLAB
To listen to the podcast, visit the website: http://podcasts.vk6flab.com/. You can also use your podcast tool of choice and search for my callsign, VK6FLAB.

Full instructions on how to listen are here: https://podcasts.vk6flab.com/about/help

A curious thing happens when you become part of the amateur community, you start to talk like an amateur. This phenomenon isn't specific to being a radio amateur, it happens whenever you join any community. Lead by example, one word at a time, you start to inherit a vocabulary that represents that community. Amateur radio, rife with acronyms and so-called Q-Codes, a standardised set of three-letter codes that start with the letter "Q", does this in spades.

If you've been around amateurs for more than 30 seconds, it's likely that you have already heard QSL, QTH and QRM, colloquially short for "Yup", "Home" and "Noise". There's an official meaning if you're keen. You can use the three letters as both a question and an answer, so QSL can mean "Can you acknowledge receipt?" and "I am acknowledging receipt."

Similarly, QTH means "What is your position in latitude and longitude (or according to any other indication)?" and QRM means "Is my transmission being interfered with?"

In those cases, used either with Morse code or Voice, they can make getting the message across simpler, faster, and more accurate, all important aspects of communication. It's easier to get QTH across to an amateur who doesn't speak English as their first language than it is to ask the whole question.

Other letter groups also creep into common language of an amateur. You've likely heard the letters:

"XYL", but if you haven't, let me explain. Given that amateur radio is an activity dominated by men, "YL" refers to Young Lady and "XYL", refers to eX-Young Lady, a less than complimentary way of referring to one's wife.

I'd like to point out something curious.

In Morse code, XYL is sent using:
-··- -·-- ·-··

It's intended to represent the word WIFE which is sent in Morse code as:
·-- ·· ··-· ·

Now, if you know anything about Morse, you'll know that a dit is one unit, a dah is three. Individual elements are spaced by one unit. The space between letters is three units and the space between words is seven units.

Armed with that knowledge, XYL takes 39 units and WIFE takes 31 units to send.

So, sending the shortcut actually takes longer and it's clear that this choice is not about efficiency. Describing someone as an eX-Young Lady to refer to your Significant Other seems very 1950's to me. In the situation where you are the female amateur operator, the apparently appropriate way to refer to your Significant Other is as Old Man or "OM". Are female operators supposed to refer to themselves as YL or XYL? Really?

Sexism aside, this is extremely offensive in a same-sex and gender fluid community.

Then there's the symbol "88", apparently meant to refer to "Hugs and Kisses", not something I'd feel comfortable sending to anyone other than my partner who is emphatically not an amateur, let alone the idea that it would be appropriate to send it to any random station or the connotations around males sending such a message to a random female operator.

So, given that we now live in the 21st century and we're no longer in 1950, perhaps it's time to consider what language we teach new amateurs.

One proposal by Chris M0YNG is to refer to the Operator as "OP" and the Significant Other as "SO". Seems like a good start.

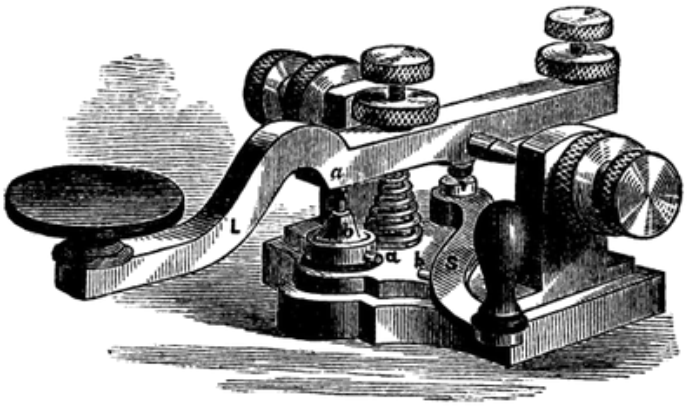
I will point out that this conversation was brought to my attention by Andreas DJ3EI who was participating in a Mastodon.radio conversation with Tim N7KOM who started the thread.

I think it's a worthwhile thing to discuss such an evolution of our language, it goes to the heart of our community, you are what you say you are, and words matter.

So, what words, acronyms and symbols do you use in your amateur community and what are you teaching new amateurs?

~ *I'm Onno VK6FLAB*

Describing someone as an eX-Young Lady to refer to your Significant Other seems very 1950's to me.



Measuring the Solar Flux Index at home…

By ONNO BENSCHOP VK6FLAB

Recently the Australian Space Weather Forecasting Centre issued an alert for a Coronal Mass Ejection or CME expected to impact Earth within 24 to 36 hours. This was presented within the context of seeing the resulting Aurora, but as a user of the HF radio spectrum, I'm subscribed to their email list, not for the pretty pictures, though I would be delighted to actually see them with my mark one eyeball, I'm on the list for the impact on propagation for my hobby.

As a good citizen I shared the alert with my community both via email and social media and as a result I received some questions and comments. One question was, "What does this mean?", one comment was "it's not going to impact the United States."

My response was to point out that HF propagation and the impact of the Sun is a very deep rabbit hole and encouraged further research by supplying several links, including a very detailed video by Rohde and Schwarz titled "Understanding HF Propagation", very, highly, recommended.

Whilst watching that video I discovered that the Solar Flux Index is measured using a receiver tuned to 2800 MHz or 2.8 GHz. Being in the business of having receivers scattered around my shack, I asked myself if I had something that was able to receive on that frequency. My RTL-SDR dongle doesn't cut it without extra hardware, it tops out at 1.75 GHz.

However, my PlutoSDR has a standard frequency range that goes up to 3.8 GHz out - of the box - and with some tweaks can make it to 6 GHz, so well and truly within range.

Now, before I move on, I should mention that an RTL-SDR is a cheap, as-in $20, USB computer accessory that looks like a thumb -drive and is ostensibly built to receive digital television, or DVB-T signals. I've spoken about this previously. It can be used to receive radio frequencies outside the purpose it was built for. The PlutoSDR, or to give its official name the ADALM-PLUTO, on the other hand, something which I've also spoken about, is a single board Linux computer made by some smart people at Analog Devices, specifically for the purposes of learning and experimentation with receiving and transmitting RF. It comes with all manner of documentation and software and to be honest, I'm a little bit in love with mine.

Back to measuring stuff. In this case I'm attempting to measure the power levels of radio frequencies at 2.8 GHz. I know of a simple tool called rtl_power that can measure RF power over time and started investigating if that tool had been hacked to be able to use the PlutoSDR, rather than the RTL-SDR dongle. It might have been, but I've not yet discovered it, however, that in turn led me to several other tools, most of which I'm still investigating.

What it does tell me is that I'm not the first person to tread these paths, much has happened and been documented in the analogue sphere, some has been done using digital I/Q data and a transverter, a device that can multiply radio frequencies to make them appear in a different part of the radio spectrum, but I'm not yet sure if anyone has made a Solar Flux Index device out of a PlutoSDR.

I recalled a wonderful little tool that I've also talked about before, there's a theme here, I'm sure, but the tool, "csdr", written by Andras HA7ILM, which allows you to do all manner of interesting things to a stream of raw data, specifically RF raw data. It has a function called logpower_cf which Andras describes as "useful for drawing power spectrum graphs", which is precisely what I'm looking for.

Armed with that I'm now in the process of building a compiled version using Docker, so I can run csdr on my PlutoSDR and perhaps generate a power spectrum graph for 2.8 GHz. Of course that will now require that I learn how to extract raw data, known as I/Q data from the PlutoSDR command -line, process it through the logpower_cf function, output an image and hopefully show the result as a web-page. At the moment I'm still in the weeds with a Makefile, but that's not unusual.

Needless to say that I'm working on it and the result will no doubt turn up on my github page when it's done. In the most innocent terms possible, how hard can it be?

One takeaway that really needs to be expressed out loud, even if I've hinted at it. All the bits I've talked about here are things I've already been playing with. It wasn't until I came across a salient piece of information about the Solar Flux Index and how it was measured that all the puzzle pieces came together, the PlutoSDR, csdr, rtl-power, logpower_cf, the SFI and a web-server, that I could even imagine this happening.

The point being that even if you have all of the puzzle pieces in your hands, it might still take one missing piece of information for your brain to go "Ah-ha, wow, yes, this makes sense, I can do this."

So, keep collecting puzzle pieces, relevant to your own interests and one day you too will get to this point.

~ I'm Onno VK6FLAB

All podcast transcripts are collated and edited in an annual volume which you can find by searching for my callsign on your local Amazon store, or visit my author page: http://amazon.com/author/owh. Volume 7 is out now.

Feel free to get in touch directly via email: cq@vk6flab.com, follow on twitter: @vk6flab or check the website for more: http://vk6flab.com/

If you'd like to join a weekly net for new and returning amateurs, check out the details at http://ftroop.vk6flab.com/, the net runs every week on Saturday, from 00:00 to 01:00 UTC on Echolink, IRLP, AllStar Link, IRN and 2m/70cm FM via various repeaters.

If you'd like to participate in discussion about the podcast or about amateur radio, you can visit the Facebook group: https://www.facebook.com/groups/foundations.itmaze

This podcast episode was produced by Onno (VK6FLAB). You can find more at http://vk6flab.com/

KB6NU'S HAM RADIO

$30 Lowe's Antenna

All-band antenna on a budget

by DAN ROMANCHIK KB6NU

Dan Romanchik KB6NU blogs about amateur radio at KB6NU.com when he's not trying to figure out which way current flows. Dan teaches ham radio classes, and operates CW on the HF bands. Look for him on 30m, 40m, and 80m. You can email him at cwgeek@kb6nu.com

I'm a big fan of homebrewing antennas, especially commercially-available antennas. So, when I saw this posting on the qrptech mailing list, I asked the author, Will, KI4POV, if I could re-post it here. So, here it is, with his permission. Thanks, Will!... Dan

I recently decided that the antenna situation at the shack needed an upgrade. I've been using a fan dipole for a little over a year now. It worked great when I had it cut for 2 bands, 40 and 20. However as I started wanting more bands and adding more legs, the performance got progressively worse. I needed something else.

After a lot of reading and research, I kept coming back to a non-resonant doublet fed with ladder line. The low loss of ladder line seemed like that perfect solution to my issues. I looked into antennas like the St. Louis Doublet, but I didn't have a huge roll of computer cable lying around, plus I wanted something that could potentially handle at least 100 watts in the future if I ever build an amp and go QRO.

I went to Lowe's and after wandering around, here's what I came up with.

I bought a 100 foot roll of 18 gauge speaker wire. my goal was a 100 foot doublet, so after splitting the two wires, this gave me 100 feet of antenna and 50 feet of feed line.

Next, I needed spacers for the ladder line portion. What I found was these bags of cable staples. They're about US$6 dollars per bag. I bought two bags worth to do the whole antenna.

These are a UV-resistant plastic spreaders that are a bit under an inch long with finishing nails through each side. They are made secure cable and wire runs in place. After pulling the two nails out, you are left with a plastic spacer that the two wires of the ladder line can be run through after drilling it out just slightly. Admittedly, pulling out all the nails and drilling all the holes took a couple of hours, but it really wasn't to bad once I got a system going. After that, it was just a matter of sliding the spacers onto the wire, spacing them appropriately (I put one about every 4 inches), then securing them in place with some weather-resistant hot glue.

From there on out, the rest was pretty quick and easy. I made my center insulator out of a small scrap of plexiglass I had and zip-tied the wires to it through small holes I drilled.

I've got it up around 25 or 30 feet in a tree behind our house.

I'm matching it with a t-match tuner and a tiny 1:1 current balun that I plan to show in a separate post. I was able to get a good match on 80-15 meters, and based on RBN data, I think it may be a better performer than my fan dipole. I need more time to determine how it stacks up. Band conditions have not been great the past few days.

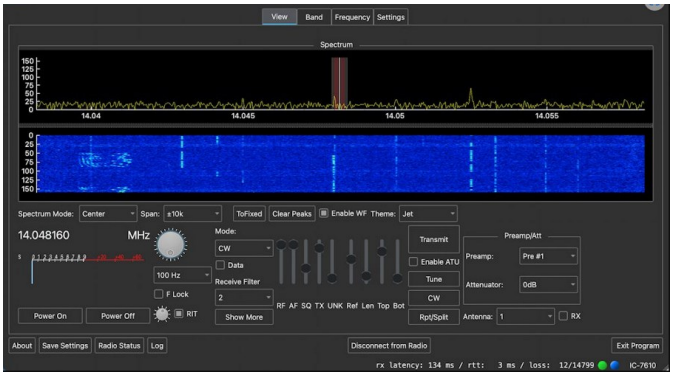
Anyway, there's nothing new or earth-shattering here, but just wanted to share that even with today's prices, you can still put together a decent "all-band" antenna on a budget if you're willing to invest a little time and effort.

~ *Dan KB6NU*

Playing around with WFview

Back when I had an IC-7300, one of the things I lamented is that the display wasn't bigger. I had heard about wfview, which is open-source software designed to control modern Icom radios, but I never did get around to installing it.

Then, I purchased a Flex 6400. As far as computer display and control, the Flex is wonderful. You can make the display as big as you want, and all the most commonly-used controls are readily available.



I missed having real knobs and buttons, though, so a couple of months ago, I got a good deal on an Icom IC-7610. I'm an Icom fanboy from way back, but there are some things about computer control that I miss, so I decided to finally download and install wfview.

The download and application install went swimmingly. Getting the program settings correct wasn't quite so easy, however. For some reason, I just couldn't seem to get wfview to talk to my radio over the LAN connection. I think that there were a couple reasons for this:

- wfview was originally written to control IC-7300s over the USB port.
- The document could be a little more explicit.
- Operator error (namely me)

Let me give you an example. On the Getting Started page, it says to "Enter the [6] username as set on the radio," where [6] is a text box labelled "Username." What the documentation doesn't say is that what you should type into this box is the value that's entered as "Network User1 Name" on the radio.

What really tripped me up is figuring out the IP address of the radio. In the wfview forum topic IC-7610 Connect Over LAN, I was asked what my radio's IP address was and if I could ping it from my computer. To make a long story short, the radio's IP address is found on the radio under Settings -> Network -> DHCP. I suppose that this is a logical assumption, but it just didn't occur to me.

So anyway, after fiddling with it for a couple of hours probably, and enlisting the help of a friend of mine who knows more about networking than I do, I finally got it running. I do like being able to make the display bigger than the display on the radio. I also like the ability to set some parameters by just clicking. For example, it's nice to be able to select the displayed frequency span by just selecting from a drop-down menu, rather than cycling through the options by pressing a button on the front panel. For the most part, though, I'm not sure that it offers users much, if you're going to run it on the shack computer.

Where I do think it will come in handy is on my MacBook laptop. I installed it on the laptop, and was easily able to access the computer via WiFi. Now, I can operate the radio from my deck on a nice summer day.

Unfortunately, I can't seem to operate CW, though. One of wfview's features is what they call the CW sender. Unfortunately, the CW sender isn't quite as finished as the rest of the software, and this limits its usefulness. Apparently, it's prone to crashing. I did get it to send QRL?, but then it wouldn't send CQ for me. I'm looking forward to the next release, which is supposed to fix these bugs and add some cool CW operating features.

~ Dan KB6NU

No-Ham Recipes

By BETTY HAUBRICH VE5FI

Champ

This is an Irish recipe of my mother's. I find that new green onions in the spring are good in this recipe, 'tis a charmingly simple ting. Such comfort food, oh my! OK, so my accent is more Newfie than Irish, but you get the point.

This is simple, feel-good food. Champ is a potato specialty in Ireland and is one of my favorite side dishes. Delicious and easy, champ is made by warming chopped green onions in milk before mixing them through mashed potatoes. Topped with a knob of melting butter these onion-laced spuds ooze with buttery goodness.

The Irish love their spuds, and as a result, they expertly serve potatoes in many ways. Champ is made throughout Ireland, but especially in the northern counties. It’s a great alternative way to serve mashed potatoes, and very easy to make from scratch.

The British have a similar dish called "spring onion mash." This would go well with roast turkey, roast chicken, roast beef or roast pork, Yorkshire pudding, and a green salad on a cool night. Set out the candles, turn off the lights, open the drapes and look out at the stars as you dine.

Suggested proportions in [square brackets] to right of ingredients list.

- Mashed potatoes (can be left over) [4 large Russet potatoes, baked and scooped]
- Milk [1 cup whole milk]
- Green onions [1 cup thinly sliced green onions]
- Margarine [4 tablespoons margarine]

By warming milk with chopped green onions, or scallions as they say in Ireland, the milk becomes infused with a subtle onion flavor, that once combined with mashed potatoes, takes those taters to a whole new level of tastiness.

Mash together all the ingredients and heat… simple.

Serve.

~

Back to Basics

From The Canadian Basic Question Bank

The mystique of PEP, RMS, and ERP: Key metrics in radio communication

John Schouten VE7TI has been teaching amateur radio courses for over 20 years, and is the Course Coordinator for Surrey Amateur Radio Communications

Nothing quite matches the 'deer in the headlights' look of non-techies taking the Basic Amateur Radio course, than a discussion of PEP, RMS, and ERP. These are concepts we teach in the receivers and transmitter portion of our course. The exam usually has at least one question, so we will explore the topic in this issue.

In the world of radio communication, several essential metrics help measure the performance and effectiveness of transmitting and receiving signals. Three key metrics that play a vital role in radio communication are Peak Envelope Power (PEP), Root Mean Square (RMS), and Effective Radiated Power (ERP). Understanding these metrics is crucial for radio engineers, operators, and enthusiasts to ensure efficient and reliable communication. This issue aims to explain PEP, RMS, and ERP, their significance, and how they are calculated.

The BASIC Question bank has numerous questions on the topic, most of them confusing to new students. Here is one of them:

B-1-17-1 What amount of transmitter power should radio amateurs use at all times?

A. 250 watts PEP output

B. 2000 watts PEP output

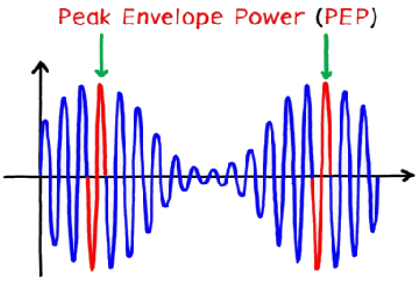
C. The minimum legal power necessary to communicate

D. 25 watts PEP output

What is Peak Envelope Power (PEP)

Peak Envelope Power (PEP) refers to the maximum instantaneous power delivered to the antenna transmission line during a transmission cycle. It represents the highest power level attained by the radio signal envelope. PEP is measured in watts and is an

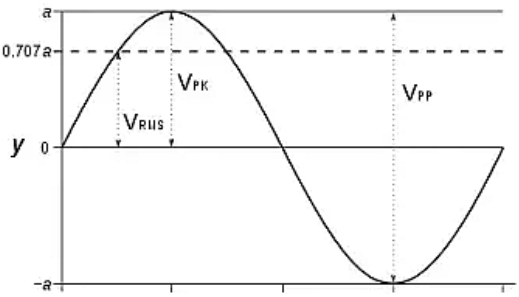
important metric in radio communication as it determines the signal's maximum power output. This metric is particularly relevant for amplitude modulation (AM) and single-sideband modulation (SSB) systems.



PEP is essential for assessing the overall system capability and ensuring that the transmitter does not exceed its designed power limits. Exceeding the specified PEP can result in distortion, interference, and potential damage to the transmitter or other equipment. Therefore, it is crucial to monitor and control PEP to maintain efficient and reliable radio communication.

What is Root Mean Square (RMS)

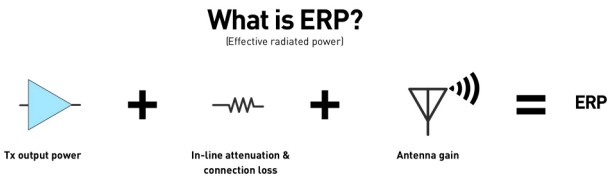
Root Mean Square (RMS) is a statistical measure used to calculate the average power of a time-varying signal. In radio communication, RMS is typically used to determine the average power output of a continuous waveform. Unlike PEP, which measures the maximum instantaneous power, RMS provides an indication of the average power level over time based on .707 of the peak power value.



RMS is particularly important for modulation schemes such as frequency modulation (FM) and phase modulation (PM) systems. These systems rely on maintaining a consistent power level to ensure signal integrity. By measuring RMS, radio operators can gauge the overall power output of the transmitter and adjust it accordingly to optimize signal quality and coverage.

What is Effective Radiated Power (ERP)

Effective Radiated Power (ERP) is a metric used to quantify the power density of a radio signal as it is radiated from the antenna. ERP takes into account not only the power generated by the transmitter but also the gain and efficiency of the antenna system. It provides a measure of the actual power that is effectively radiated into space and contributes to the signal's coverage area.



ERP is especially crucial for assessing the range and coverage capabilities of a radio transmitter. By calculating ERP, engineers can determine the signal strength at various distances from the antenna and design systems to achieve the desired coverage area. ERP is typically measured in watts and is an essential metric for planning and optimizing radio communication systems.

PEP, RMS, and ERP are fundamental metrics in radio communication that help assess the power levels, efficiency, and coverage capabilities of radio transmitters. Peak Envelope Power (PEP) represents the maximum instantaneous power delivered to the antenna transmission line, while Root Mean Square (RMS) provides the average power output over time. Effective Radiated

Power (ERP) measures the power density of a radio signal as it is radiated from the antenna, accounting for the antenna system's gain and efficiency.

What then is DC Input Power?

In the early days of radio, meters to measure RF power were not generally available, but obviously you could not get more RF power from a final output stage than the DC power supplied to it. The term used was 'maximum transmitted power in terms of DC input' to the final stage, for Amplitude Modulation. This could be simply measured by knowing the DC supply voltage and multiplying it by the current flowing through the final tube or transistor. DC voltmeters and ammeters were part of the transmitter and mounted on its front panel.

Remember Ohm's Law: Power = Voltage x Current. As the supply voltage was normally constant the station's maximum power could be calculated from the current displayed on the ammeter.

There is another question in the Canadian Basic question bank along the same vein that compares DC input and output power.

B-3-11-11 The difference between DC input power and RF output power of a transmitter RF amplifier:

A. is due to oscillating

B. radiates from the antenna

C. appears as heat dissipation

D. is lost in the transmission line

Power Amplifiers have a certain 'efficiency', the ratio of DC power required to obtain an RF output. The difference goes up in heat. This is the reason for the 'heat sinks' on the back of transmitters.

Back to our original question…

B-1-17-1 What amount of transmitter power should radio amateurs use at all times?

C. The minimum legal power necessary to communicate

According to Canadian ISED regulations, Amateurs shall use the minimum legal power necessary to communicate within these restrictions:

- BASIC Qualification = 250 watts DC input or 560 watts PEP ("where expressed as radio frequency output power measured across an impedance-matched load i.e. 50 ohms").
- For the ADVANCED Qualification that is 1000 watts DC input.
- The Morse Qualification has no bearing on the allowed power.

By understanding and monitoring these metrics, radio engineers and operators can ensure efficient and reliable communication, avoid signal distortion and interference, and optimize the coverage area. These metrics are essential tools in the design, operation, and maintenance of radio communication systems, enabling effective communication across various industries and applications.

~ John VE7TI

Social Reminder

The Saturday weekly social gathering is once again 'on' at the Denny's Restaurant, 6850 King George Blvd., Surrey BC from 07:30—09:30. All are invited. Afterwards, we will host workshops and will be available to invigilate Amateur Radio exams at the OTC, 5756—142 Street, Surrey from 10-noon.

Calling all New Amateurs: Get your Name in Lights!

Did you get your Amateur Radio certficate within the past year or two and want to introduce yourself through TCA to the Amateur Radio community? If so we would love to hear from you.

Drop a line to tcamag@yahoo.ca and tell us how you were introduced to the magic of Amateur Radio.

Do you credit any particular Amateur ("Elmer") with getting you started? Which aspect of the hobby do you enjoy so far?

Please be sure to include your name, call sign, date and level of certificate – and don't forget to include a photo or two. We hope to hear from you soon!

Our Radio Courses

Do you need more information about our courses?

https://bit.ly/RadioCourses

or scan the QR-code with your smart-device camera

Study Links for more information

Whether you are new to the hobby or brushing up on skills, you should find these study links helpful:

1. RIC-7 is the entire up-to-date Industry Canada (IC) Basic Question Bank. http://tinyurl.com/CanadaBasicQB
2. Industry Canada (ISED) on-line practice page: https://apc-cap.ic.gc.ca/pls/apc_anon/apeg_practice.practice_form
3. The Amateur Radio Exam Generator is at: https://www.ic.gc.ca/eic/site/025.nsf/eng/h_00040.html
4. The ExHaminer Study software for Windows is at: https://wp.rac.ca/exhaminer-v2-5/

Contact SARC if you wish to write the Basic or Advanced Exam. If you pass we'll even give you a year free as a SARC prospective member!

Newly Licensed? When you receive your paper license in the mail, it will come with a form that can be filled out and mailed to the Radio Amateurs of Canada office, at which point an introductory RAC one-year membership will be set up. Introductory memberships are identical to our existing basic memberships and you will receive The Canadian Amateur magazine for one year.

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Those pesky block diagrams

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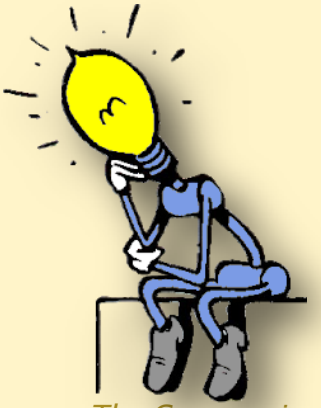
Our new students are often confused by the block diagrams for receivers and transmitters that are part of the Canadian Basic Amateur Radio Question Bank, and it is frequently mentioned in our course feedback as one of the more challenging lessons. As we have previously mentioned, there is a freeware program to practice assembling block diagrams called 'Ham Puzzle available as a free Windows download from Radio Amateurs of Canada at: https://www.rac.ca/wp-content/uploads/2014/04/HAMpuzzle/HAMpuzzle12.zip. It can also run under Wine on a Mac.

Even with Ham Puzzle our students continue to look for a better way to commit these block diagrams to memory. If you, or your club, are involved in instruction and you have a memory aid, we'd love to pass it on to our students.



~ John VE7TI
VE7TI@myrac.ca

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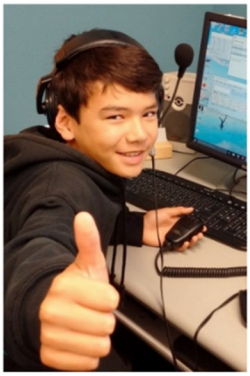

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JULY 2023

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		For details on all SARC events, go to ve7sar.net			Contest: RAC Canada Day—1700 hrs start	1 Coffee: 0700-0830 Denny's 6850 King George Blvd., Surrey OTC Open—10-Noon Contest: RAC Canada Day **CANADA DAY**
2	3	4 1930 SEPAR Net **2000 SARC Net**	5	6 **2000 SARC GOTA Net**	7	8 Coffee: 0730-0930 Denny's OTC Open—10-Noon
9	10 On-line Basic Course 19:00 hrs	11 1930 SEPAR Net **2000 SARC Net**	12 **SARC Social Evening OTC** 1900-2100	13 **2000 SARC GOTA Net**	14	15 Coffee: 0730-0930 Denny's OTC Open—10-Noon Contest: NA QSO Party (RTTY)
16 Contest: NA QSO Party (RTTY)	17 On-line Basic Course 19:00 hrs	18 1930 SEPAR Net **2000 SARC Net**	19	20 **2000 SARC GOTA Net**	21	22 Coffee: 0730-0930 Denny's OTC Antenna Workshop—0930-Noon
23/30	24/31 On-line Basic Course 19:00 hrs	25 1930 SEPAR Net **2000 SARC Net**	26 1900 SARC Exec Meeting	27 **2000 SARC GOTA Net**	28	29 Coffee: 0730-0930 Denny's OTC Antenna Workshop—0930-Noon

Contest Details: http://hornucopia.com/contestcal/contestcal.html

AUGUST 2023

Sun	Mon	Tue	Wed	Thu	Fri	Sat
For details on all SARC events, go to ve7sar.net		1	2 **BC DAY**	3 **2000 SARC GOTA Net**	4	5 Coffee: 0730-0930 Denny's 6850 King George Blvd., Surrey OTC Open: 10-Noon Contest: NA QSO Party (CW)
6 Contest: NA QSO Party (CW)	7 **BC Day Holiday**	8 1930 SEPAR Net **2000 SARC Net**	9 **SARC Social Evening OTC** 1900-2100	10 **2000 SARC GOTA Net**	11	12 Coffee: 0730-0930 Denny's OTC Open: 10-Noon Contest: WAE DX (CW)
13 Contest: WAE DX (CW)	14 On-line Basic Course Review 19:00 hrs	15 Basic Course Exam (OTC) 18:00 hrs 1930 SEPAR Net **2000 SARC Net**	16	17 **2000 SARC GOTA Net**	18	19 Coffee: 0730-0930 Denny's Basic Course Exam (OTC) OTC Open—10-Noon Contest: WAE DX (SSB)
20 Contest: WAE DX (SSB) Contest: ARRL Rookie Roundup (RTTY)	21	22 1930 SEPAR Net **2000 SARC Net**	23	24 **2000 SARC GOTA Net**	25	26 Coffee: 0730-0930 Denny's OTC Open—10-Noon
27	28	29 1930 SEPAR Net **2000 SARC Net**	30 1900 SARC Exec Meeting	29 **2000 SARC GOTA Net**	30	

Contest Details: http://hornucopia.com/contestcal/contestcal.html

Radio-Active

Profiles Of SARC Members

Meet Doug Jeffery VA7JDJ

coordinated by LARRY BLOOM VE7LXB

I was born in Ontario but moved to Vancouver in the 1960's when my father was transferred to a branch office in BC. My parents still live in North Vancouver, but my older brother moved back to Ontario after graduating from university. I live in East Vancouver with my wife, Doreen.

I was interested in many things as a young boy but I particularly loved to explore how things work. I loved garage sales and taking things apart to see what was inside. With my parents' encouragement, I explored the world of electronics and mechanics. One Christmas I received a 100 in 1 electronics kit. I think we built all 100 circuits before New Years! Around this time my parents upgraded to a color television and my brother and I received the old set to work on. It was broken, so we decided to salvage parts. The picture tube yoke provided a good supply of enamel wire. It wasn't long before we were climbing trees in the back yard and stringing the wire through the branches. Connecting the long wire antenna to an old vacuum tube console radio (bought at a garage sale!) made it possible to hear shortwave broadcasts from around the world. I was fascinated that I could hear people talking from so far away.

One summer, on our family vacation, we were camping in Greenwood, BC. A family friend was in a nearby site and I realized that he was a ham radio operator. In the evenings he would sit outside and talk on the radio. Captivated, I listened intently and may have overstayed my welcome. However, he was very encouraging asking me electronics' questions, most of which I could answer. On our last day at the camp, he gave me a well-worn copy of the ARRL Handbook. Inside the front cover

was the message “Hurry up and get your ticket!.” I spent hours studying that book, and I credit that gift as further stimulating my interest in electronics. Unfortunately, as a youngster I was not able to master Morse code, so I didn’t secure an amateur radio license at that time.

I pursued other interests as well. I discovered photography and the joys of developing film. Building and flying model airplanes encouraged me to construct things with my hands. I acquired some knowledge of mechanical and aeronautic design. Hiking and camping took me to interesting places and taught me independence.

Then there was my interest in cars which began long before I had my license. With some convincing, my parents allowed me to buy a used car with my part time earnings. Not long after, at the tender age of 15, I bought my first car, a 1966 Mustang. My parents were incredibly patient while I put it into drivable condition. I worked countless hours replacing the broken transmission and repairing other problems in our carport. Eventually, proudly, I owned a drivable car.

Around the time I entered college, I discovered the amazing world of SCUBA diving and spent hours underwater blowing bubbles. I eventually attained my SCUBA instructor rating which steered me from my studies and into the diving business. Not long after, I became manager of several Vancouver area stores. Then I met my wife-to-be, Doreen. With our shared interest in SCUBA, we explored the underwater realm together. Over the years, fortune has allowed us to dive extensively throughout BC as well as travel to exciting tropical destinations.

One of the instructors who had worked for me in Vancouver took a job in the Cayman Islands. One day she called asking if I would be interested in helping with a store that her company was opening. I jumped at the chance and headed South. Unfortunately,

the idyllic image that I had of working in the Caribbean did not live up to the reality of the work. The final straw was the tropical storm that flooded my apartment. So, I headed back to Vancouver.

Although I intended to continue in the SCUBA industry, this time I wanted to run my own store. With generous family support, the doors to the West Coast Scuba Centre (WCSC) in Port Coquitlam were opened in 1991. Doreen & I worked tirelessly operating the store, teaching SCUBA diving and leading local and tropical diving excursions. In 1993 Doreen and I were married and continued to work together in our business.

Then, in 1996 we sold WCSC and pivoted to a new business venture, led by Doreen’s father who was retiring. Sterling Elevator was opened as a specialty contracting company that installed custom elevator cab interiors. It was a terrific opportunity, and we enjoyed the flexibility of contract work. However, market conditions changed and once again we were forced to move with the times. In 2000 I went to work at Creo, an innovative technology company in the commercial printing industry, which was based in Vancouver. In 2005 Creo was purchased by

Kodak which is where I work today. During my time with Creo/Kodak I have been fortunate to have had many interesting opportunities. When I joined the company I worked as a technical instructor, teaching field service people how to install, troubleshoot and repair our products. This gave me invaluable in-depth knowledge in my next role as product support specialist. Problems that could not be solved by local service people were passed onto our team for resolution. After a few years I became product support manager overseeing a group of product support specialists. In 2012 I moved to the production side of the business, and I have stayed in manufacturing ever since. Today I am the director of manufacturing and site operations. I work with a diverse group of technicians, engineers, and managers. My goal is to improve efficiency through simplification and streamlining.

Doreen and I celebrated our 25th wedding anniversary in 2018. To memorably mark the occasion, we decided on a trip to Africa where we went on two photo safaris and visited Cape Town. Determined to get some great photos in Africa, I researched potential camera purchases. Half joking, my brother suggested using a drone for pictures and video. Although I didn't take a drone to Africa this passing comment re-kindled my interest in drones and model airplanes.

Upon returning from our trip, I purchased my first camera drone (A DJI Mavic Mini). I am fascinated by the unusual perspectives achieved with a flying camera, and what I imagine it would be like to be a bird. My interest in drones expanded to include model airplanes. Before long, I began contemplating how the radio link controls the model.

In 2022 I enrolled in the SARC Basic Amateur Radio course. This brought me full circle back to the old encouragement to "Hurry up and get your ticket." Since completing the course with the call sign VA7JDJ, I've enjoyed firsthand electronics project building, participation in 2m nets, radio contesting and HF station assembly. But I'm not done yet as I want to earn my advanced amateur license with a CW endorsement.

In closing, I want to say "Thank You" to my fellow club members who have made this a wonderful experience. SARC has been a fantastic place to learn and socialize, all with a radio focus.

So, 73 all, I hope to catch you on the air soon!

~ Doug VA7JDJ

ARDF

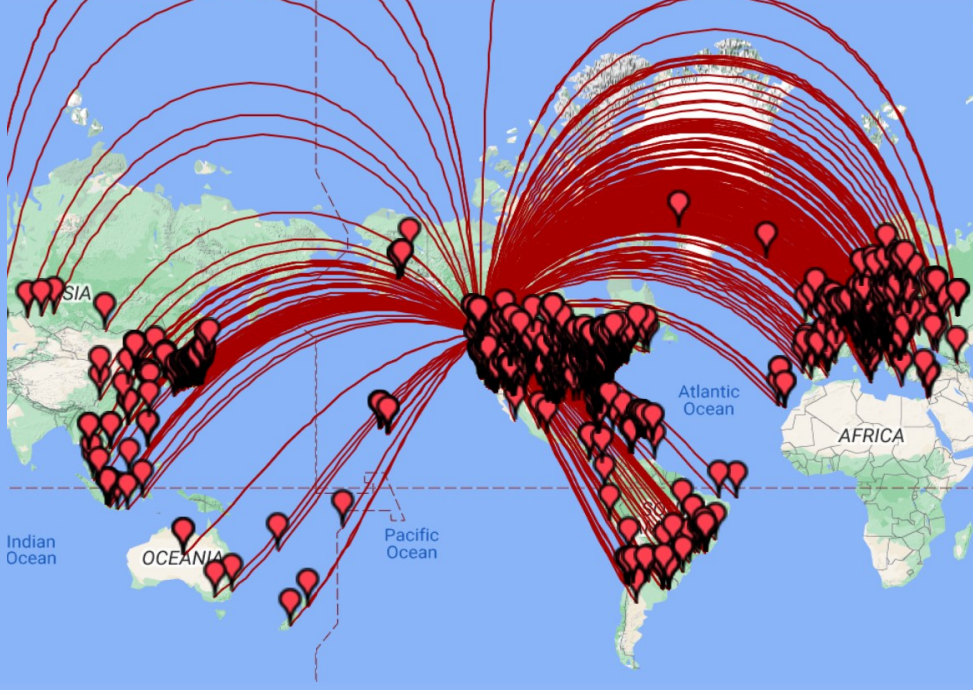
The SARC 2023 Fox Hunt

South Surrey's Crescent Park

by JOHN SCHOUTEN VE7TI

Crescent Park, South Surrey
Saturday, May 13, 2023

The Contest Contender



CQ WW WPX Contest

CW 2023

By JOHN BRODIE VA7XB

JOHN BRODIE VA7XB reporting on SARC's contesting efforts.

Thanks to Les VA7OM, Dino VE7NX, Slawa VE7LWW (and me VA7XB) for 1018 Qs in the WPX contest. We were sorry that Jan VA7VJ was ill and had to give it a pass.

We operated as CK7SAR, a special event callsign to celebrate the coronation of King Charles III. This turned out to be not the best idea as CK7 is not a well-known prefix and we got many requests for repeats.

Band conditions were unusual as EU was active late in the day on Saturday (rather than in the morning) and all bands were quiet on Sunday with DX scarce. So most of the DX action was to be found the first day of the contest.

Also, this time we made no Qs with Africa except Morocco and the islands off the west coast (Madeira, Canary Islands and Cape Verde)!

The RAC Canada Day contest is July 1st, for which we have several operators lined up to use the callsign VE7RAC. This will again be a 2-station event for us using the Field Day setup, with bigfoot tower and beam for the maximum impact. We are again privileged to use the RAC callsign and will endeavour to make a credible showing for SARC.

The summer months will be relatively quiet contest-wise, but we hope to make an appearance in at least some of the following:

- 15-16 July NA QSO Party (RTTY)
- 5-6 Aug NA QSO Party (CW)
- 12-13 Aug WAE DX Contest (CW)
- 19-20 Aug NA QSO Party (SSB)

  20 Aug ARRL Rookie Roundup (RTTY)

If interested in operating either as part of an SARC team or individually, please let me know: brodiejb@shaw.ca.

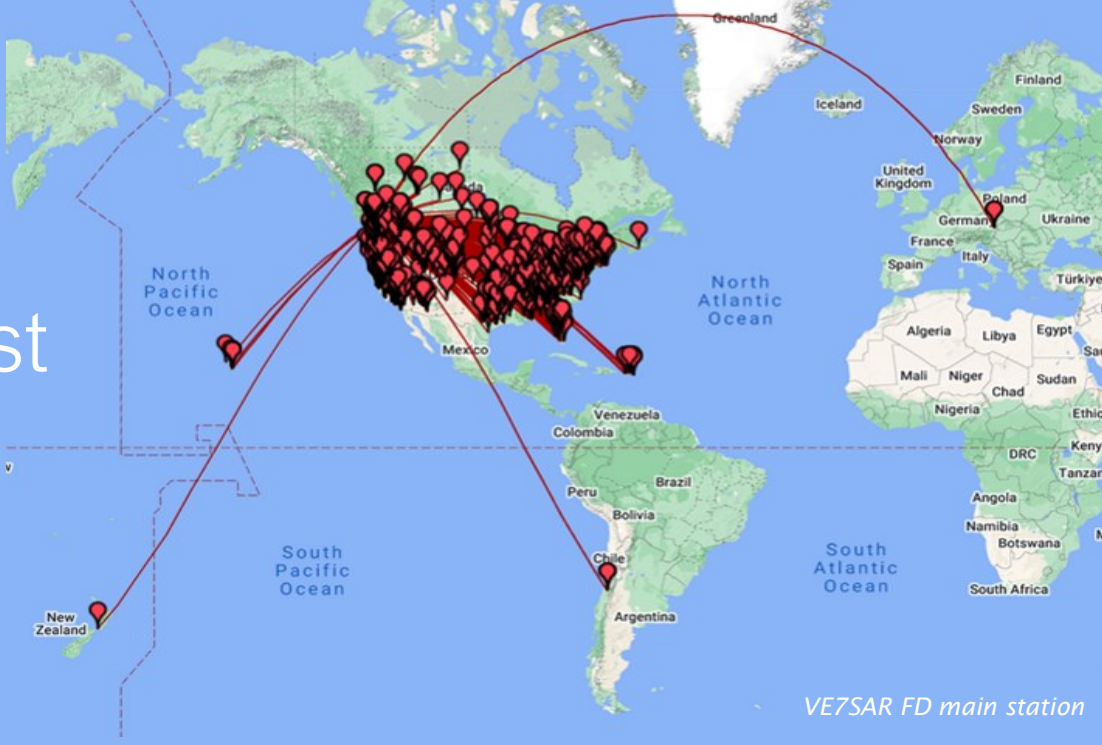
~ *John VA7XB*

CK7SAR - CN89OC

1	3W	Vietnam	2
2	4L	Georgia	1
3	4U1U	UN New York	1
4	4X	Israel	2
5	5B	Cyprus	1
6	9A	Croatia	9
7	9H	Malta	1
8	9M2	West Malaysia	1
9	9V	Singapore	1
10	9Y	Trinidad and Tobago	1
11	BV	Taiwan	1
12	BY	China	16
13	C6	The Bahamas	1
14	CE	Chile	6
15	CN	Morocco	2
16	CO	Cuba	2
17	CT	Portugal	2
18	CT3	Madeira	2
19	CX	Uruguay	1
20	DL	Deutschland	38
21	DU	Philippines	2
22	E7	Bosnia and Herzegovina	2
23	EA	Spain	12
24	EA8	Canary Islands	3
25	EI	Ireland	2
26	ES	Estonia	1
27	EU	Belarus	3
28	F	France	3
29	FK	New Caledonia	1
30	FY	French Guiana	1
31	G	England	7
32	GD	Isle of Man	1
33	GM	Scotland	1
34	HA	Hungary	11
35	HB9	Switzerland	2
36	HC	Ecuador	1
37	HL	South Korea	4
38	HP	Panama	1
39	HS	Thailand	3
40	I	Italy	11
41	JA	Japan	112
42	JT	Mongolia	1
43	KH6	Hawaii	6
44	KH8	American Samoa	1
45	KL7	Alaska	7
46	KP2	Virgin Islands	2
47	KP4	Puerto Rico	3
48	LA	Norway	2
49	LU	Argentina	9
50	LY	Lithuania	5
51	LZ	Bulgaria	8
52	OA	Peru	1
53	OE	Austria	2
54	OH	Finland	8
55	OH0	Aland	1
56	OK	Czech Rep.	13
57	OM	Slovakia	9
58	ON	Belgium	10
59	OX	Greenland	1
60	OZ	Denmark	1
61	P4	Aruba	1
62	PJ2	Curacao	2
63	PY	Brazil	21
64	PY0F	Fernando de Noronha	1
65	S5	Slovenia	7
66	SM	Sweden	7
67	SP	Poland	18
68	SV	Greece	1
69	SV9	Crete	1
70	TF	Iceland	1
71	TI	Costa Rica	2
72	UA	Russia EU	14
73	UA0	Russia AS	4
74	UN	Kazakhstan	3
75	UR	Ukraine	3
76	V2	Antigua and Barbuda	
77	V8	Brunei	
78	VE	Canada	
79	VK	Australia	
80	VP2M	Montserrat	
81	VP5	Turks and Caicos Isla	
82	VR	Hong Kong	
83	W	USA	
84	XE	Mexico	
85	YB	Indonesia	
86	YL	Latvia	
87	YO	Romania	
88	YU	Serbia	
89	Z3	North Macedonia	
90	ZF	Cayman Is	
91	ZL	New Zealand	
92	ZP	Paraguay	

...more from

The Contest Contender



VE7SAR FD main station

Field Day 2023

A prime year for GOTA?

By LARRY BLOOM VE7LXB

Larry Bloom VE7LXB is a Director and the 'New Ham Coordinator' for Surrey Amateur Radio Communications. This year he coordinated our GOTA Field Day.

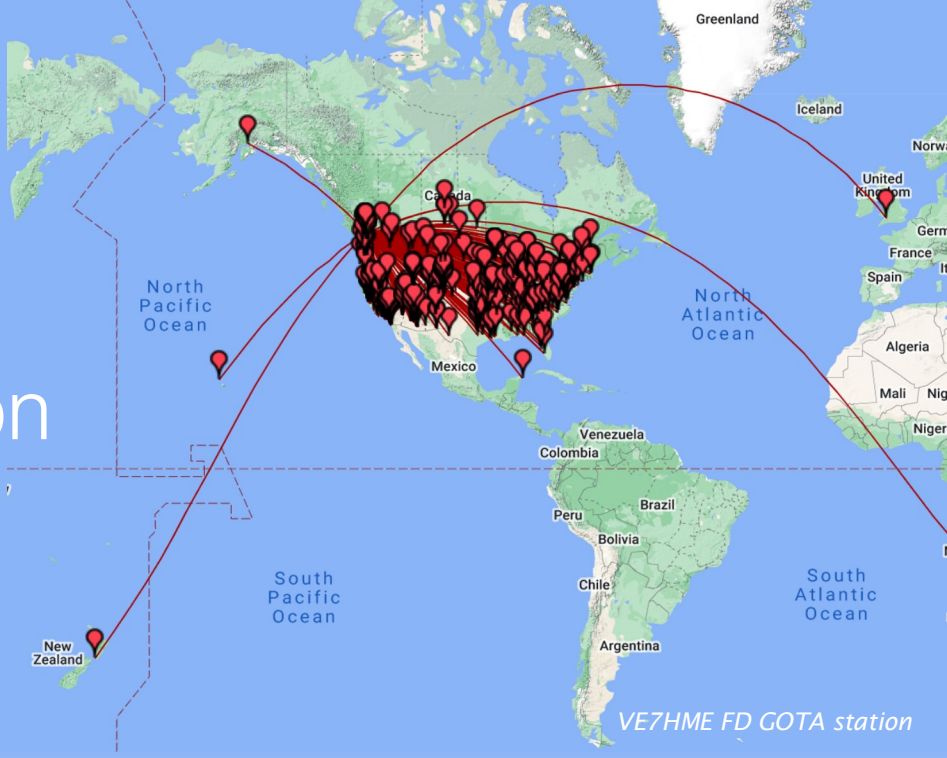
What a blast!

This year the ARRL put an emphasis on Field Day GOTA stations, and SARC New Hams rose to the occasion. Beginning at 11am PT, our GOTAs began transmitting on an Icom IC-7610. Working out of the Surrey Emergency Program Amateur Radio (SEPAR) Emergency Preparedness trailer, we utilized the club's 110' beam antenna. For the full 24 hours we ran, we pounced, and we spun the dial on the 15, 20, 40, and 80 metre bands.

As newbies, most of the GOTAs who participated in this year's Field Day had never transmitted on HF. But transmit they did! One transmitted while another assisted with the logging. Then the logger became the transmitter, and another newbie took the logger's place. And so, we rotated through. I couldn't believe how quickly they picked it up. In fact, our biggest dilemma was convincing the GOTAs to relinquish the mic!!!

Exhaustion set in by the time Field Day ended, but what an incredible experience was had by all. We learned, we experienced, and we bonded. While we realize that we'll never be able to compete as GOTAs in this event again, we're all pumped to participate as regulars during FD for years to come.

...and the GOTA Station



VE7HME FD GOTA station

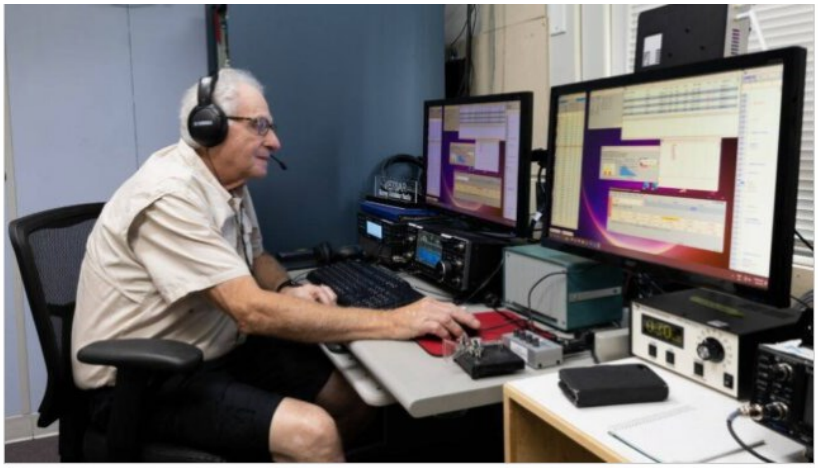
I'd like to congratulate Doug VE7JDJ, Dale VE7LWT, Lesley VE7CMI, Katrina VA7WBT, Mike VE7YEG, UB VE7UBZ, Ernie VE7ODK, Alex VA7PVC, Dmitry VA7DVO, and Manvir VA7BKI for their efforts and participation. I'd also like to thank Aravind, De, and Gary, our New Hams who dropped by to check things out and to cheer us on.

GOTA love ham radio!

~ *Larry VE7LXB*
SARC New Ham Coordinator

Our local newspaper, the Surrey Now and their sister publications reported on our Field Day plans:

https://www.surreynowleader.com/community/surreys-ham-radio-operators-hope-to-make-contact-with-every-province-and-state-during-field-day/


Larry Bloom at the operations training centre in Surrey on Saturday, May 27, 2023. (Photo: Anna Burns)

Surrey's ham radio operators hope to make contact with every province and state during field day

Exercise will use a variety of voice and data techniques to make contact with other operators across North America

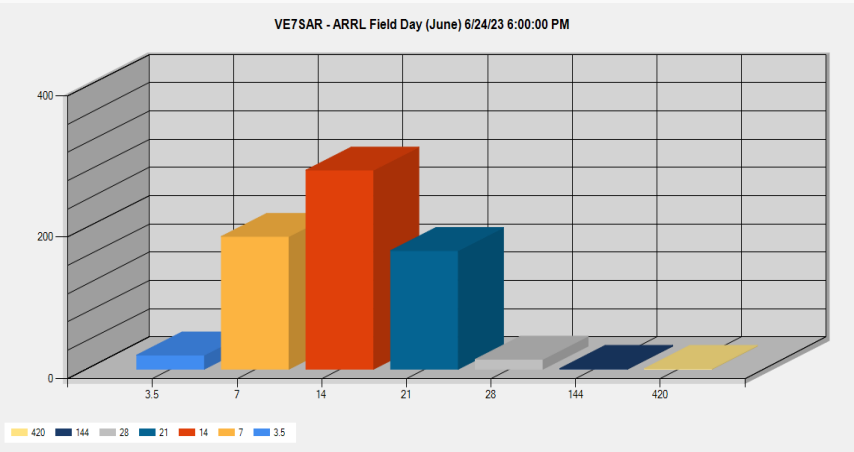
ANNA BURNS / Jun. 10, 2023 8:30 a.m. / COMMUNITY

Top: N1MM contest logging training, The SEPAR trailer used for the GOTA station.

Above: Field Day operations of VE7HME and Adrian VA7YEP making our satellite contacts.

Field Day GOTA operations; a visit from the Surrey Fire Service on behalf of our served agencies. Father and son, Dmitry and Alex, both recent grads of our Basic course on their way to becoming a formidable contesting team.

A graph of our contest station's band results.



Contesting with VE7RAC

By John Brodie VA7XB

JOHN BRODIE VA7XB reporting on SARC's contesting efforts.

By late Friday afternoon, June 30, all was set and ready to go and the operators were pumped. We would have two stations, using our own IC-7610 and a second one graciously lent to us by ICOM. We also had a new mini-computer configured with N1MM+ logger, and successfully networked with the other (thanks to Doug VA7JDJ for his help).

Because Field Day was only a week earlier, our 100 ft "Bigfoot" tower was still in place at its temporary location with the TH-7 tribander on top. One end of the 80/40 wire was anchored to the top of the tower, which gave us a better height than when in its former position – only negative was that the dipole orientation was (unavoidably) oriented with its propagation lobes SW-NE.

One station was configured to operate SSB and the second CW. With both starting at 100w, we hoped that inter-station RFI would be tolerable. To our surprise, the one radio with the amp was able to operate at up to 700 w without significant interference to the other radio. Better antenna separation was at least partially responsible for this favourable result.

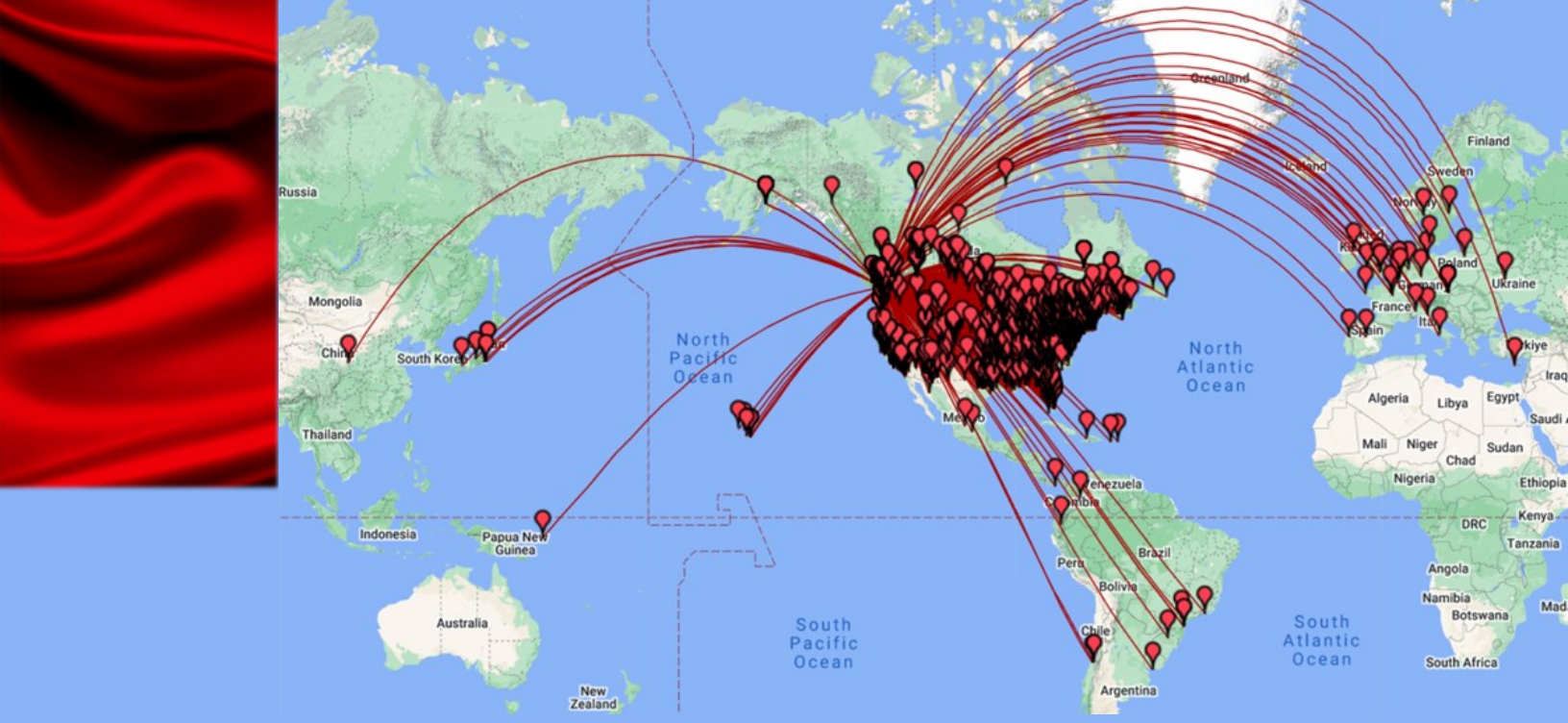
Our team comprised the most experienced of our contesters: Slawa VE7LWW, Sheldon VA7XH, John VA7XB, Doug VA7JDJ , Jan VA7VJ, John VE7TI, Les VA7OM, Jeanne VA7QD, Dino VE7NX and Steve VE7SXM.

Although we did not plan to operate between 10 pm and 6 am, the two night owls, Sheldon on SSB and Slawa on CW, surprised everyone by staying active throughout Friday night until sunrise. The result was that by 6 am, nearly 650 Qs were already in the log before the day shift even started.

Fortunately, by 7 am, both 20m and 15m were open and remained the hot bands throughout the day. 10m did not figure in our activity.

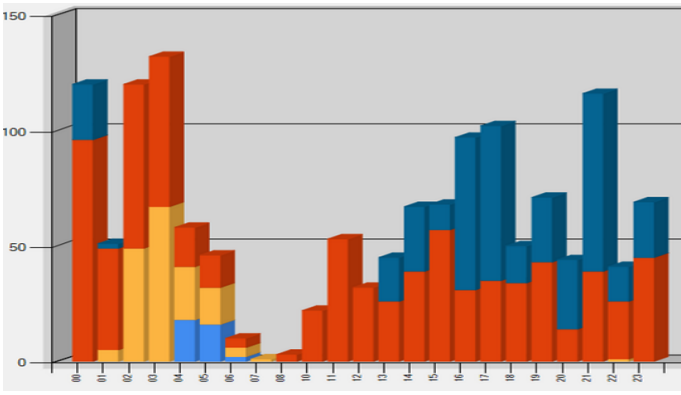
Thanks to all involved for making this contest a credit to our team and SARC.

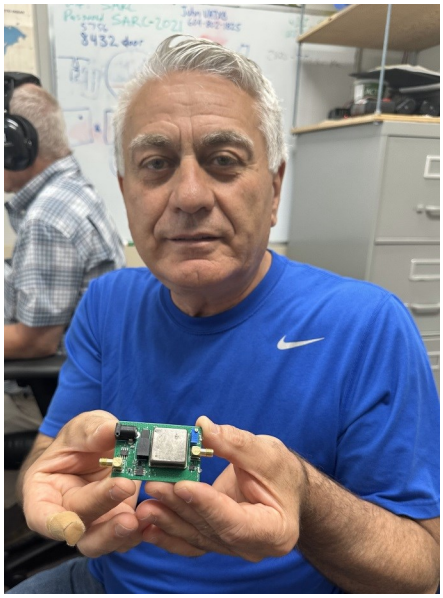
~ *John VA7XB*

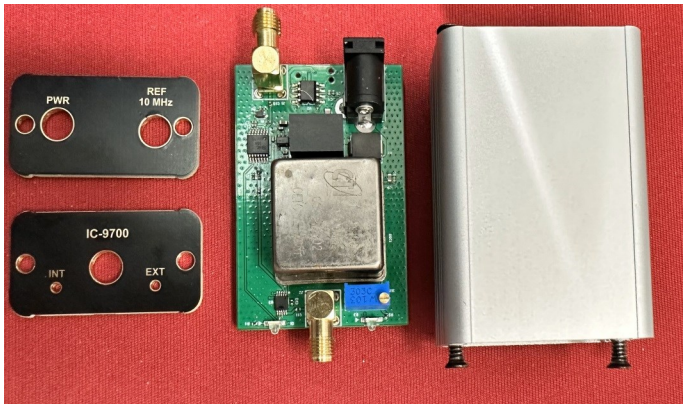


Left: Doug VA7JDJ; Centre: Jeanne VA7QD; Dino VE7NX, Les VA7OM; Right: John VA7XB

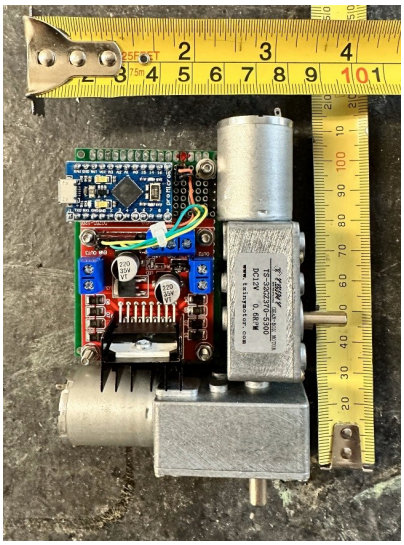
MM HP		Score	QSO	VE Prov./Terr.	
1	N6RC	687,952	1,588	76	Northern California Contest Club
2	VA2RAC	325,920	1,150	56	Contest Group du Quebec
M/2 LP		Score	QSO	VE Prov./Terr.	
1	VE7RAC	429,312	1,418	64	Surrey Amateur Radio Communications
M/S HP		Score	QSO	VE Prov./Terr.	
1	W3ACC	149,420	1,008	31	University of Iowa ARC
2	N4SS	37,314	230	27	Kentucky Contest Group
SO-ALL HP MIXED		Score	QSO	VE Prov./Terr.	
1	VE3CT	83,980	569	34	Contest Club Ontario
2	K7RL	32,200	183	28	Deep Dixie Contest Club
3	K4HQK	23,520	84	24	Potomac Valley Radio Club
4	N3DUE	10,260	44	19	Potomac Valley Radio Club
5	KC5DI	1,400	17	7	





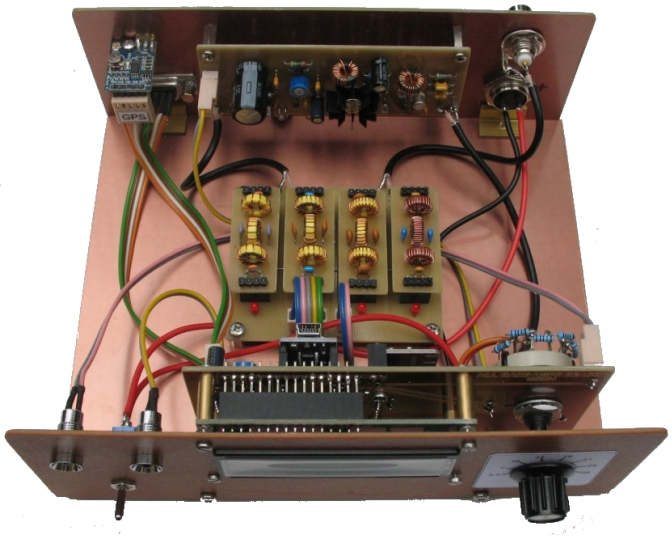


Dino VE7NX displays an oscillator to overcome drift on the iCom IC-9700, particularly on the 1.2 GHz band. He worked with an engineering friend to design the board, write the software and produce ten test units. If you have a 9700, you may wish to invest in one of these to keep any frequency drift to a minimum.



Left is our SARCTRAC satellite antenna rotator. Parts total about C$100 and it was first used on Field Day. Dino was instrumental in getting this project completed successfully. Look for an article in the next Communicator.

Right is a BIG upcoming SARC project. It is an HF multi-band WSPR transmitter useful for checking where on Earth your signal is being received. Stay tuned for more news in the fall.



General Meeting Minutes

SARC May General Meeting

May 10, 2023

Recording Secretary JEREMY MORSE VE7TMY

Attendees: 22
Start Time: 7:05pm
Location: Surrey Fire Training Centre

Welcome - (Steve McLean VE7SXM)

Scheduled Presentations (7:05pm-8:00pm)

Fox Hunt this Saturday May 13th, 2023

- Anton to provided an update, and request for assistance
- Les Tocko VA7OM/Amel Krdzalic VA7KBA – Fox Hunt presentation and discussion

Upcoming projects

- Morse Tutor and other projects (Dino)

Business meeting (8:00pm-9:00pm)

Announcements

- Annual General Meeting – 7PM, Wednesday June 14th, 2023
- Saturday Breakfast and OTC Open House. Saturday mornings 7:30am – 9:30am (or so) – Denny's at 68th and KG Boulevard
- OTC – 5756-142nd Street, open from 10am to 12pm (or so) Saturdays – Come check it out
- Hyack Parade Saturday May 27th – Ken Clarke (VE7BC) is still looking for Volunteers. Contact Ken at <ve7bc27@gmail.com>
- Memberships is due June 1st, and needs to be current to vote at the AGM
- SARC 2023 AGM – June 14th, 2023 – this location
- Field Day 2023 – June 24-25th, 2023. Field Day will be located at the OTC this year - we can use assistance, both before and during. Field Day planning meeting at Denny's, Thursday 7am (May 11th)
- Recent Parking Lot Sale and Maple Ridge Swap meet were successful

Committee Reports

Financial Report (Scott VE7HA absent)

- Balance Sheet was shared on screen

Tues night Nets - (Reg - VA7ZEB)

- Regular improvements to the net are taking place.

GOTA Net Thursday night 8pm (Larry VE7LXB)

- Wanting to get new hams (recent students) on the air.

- Workshop with various hands -on tutorials and practice with radios.
- Thursday night net for newly licensed hams 8pm

SEPAR - (Gord - VA7GK)

- It is "Emergency Preparedness week". Webinar Thurs night? 6:30pm -9:00pm Earthquakes??
- June 10th Emergency Preparedness Fair at the Mormon Church Langley. Talk about communications. SEPAR trailer will be on site.

Spring Freshet (John VE7TI)

- Attended a City of Surrey Emergency Planning Exercise. Emergency pre-planning taking place for Surrey. High risk this year as the Bridgeview area is of concern. SEPAR could be activated to help knock on doors and hand out flyers. An email will be sent to SEPAR/ SARC for volunteers with radios.
- Run Surrey Run (Sept 10th). SEPAR has been asked to assist again this year

OTC - (Gord - VA7GK)

- Air conditioner is continuously running and has been reported to the maintenance group.

Membership - (John - VA7XB)

- 114 members currently.

Elmers Report - (John VA7XB)

- One email in progress.

Contests - (John - VA7XB)

- May 13-14 - Canadian Prairies QSO Party (Phone, CW)
- May 27-28 - CQ WW WPX (CW)
- June 24-25 - Field Day
- July 1st - RAC Canada Day Contest (Phone, CW). John B to contact Keith W. for VE7RAC callsign

Repeaters Status - (Steve - VE7SXM)

- Power bar failed recently and was repaired by Horace.
- John S Some noise has been heard through the south repeater during GOTA net.
- Ion - Winlink gateway is on his desk but needs repairs? Need an FM deviation meter? Tabled for directors to discuss

Ham Class Training for 2023 (John - VE7TI)

- Almost finished the current course and it's going very well.
- Next class will be starting June 11
- September 11th for a CW Class.

Old Business

Projects in the works (outdoors) - Pending Weather

- VHF/UHF Yagi install on the Grey Tower
- Install New COAX – pending weather
- Additional Power upgrades to Bigfoot – pending weather
- 120/240 VAC power outlets from generator – Completed
- Additional Grounding - Bigfoot
- SEPAR trailer upgrades
- Hall 10 Grab and Go Kit – clean up and purging – ongoing
- OTC Upgrades – Install 3rd (Test) Station in OTC

New and other business

- SARC 2023 AGM – June 14th, 2023 – this location
- Memberships is due June 1st, and needs to be current to vote at the AGM
- Field Day 2023

Call for other New Business

Adjournment of the Business Meeting

- Steve moved that we adjourn the meeting at. 9:11pm Seconded by Gary. Carried
- Meeting adjourned at: 9:11pm

~ Minutes prepared by Jeremy Morse VE7TMY

Annual General Meeting Minutes

SARC 2023 Annual General Meeting

June 14, 2023

Recording Secretary JEREMY MORSE VE7TMY

Attendees: 24
Start Time: 7:08pm
Location: Surrey Fire Training Centre

Welcome and Call to Order

The 2023/2024 Annual General Meeting of the Surrey Amateur Radio Communications Society was called to order at 7:08pm on June 14, 2023 by President Steve McLean VE7SXM.

Confirmation of Quorum

Quorum was confirmed, as follows:

- 57 prepaid + 6 paid at door = 63 in good standing
- With 24 members actually present + 8 proxies = 32, quorum of 25% of 63 = 16 was met.

Approval of Agenda

- The agenda for the evening was presented and John VE7TI moved that the agenda be accepted. Doug VA7JDJ seconded. Carried.
- Approval of the Minutes from The 2021 AGM
- Jeremy Morse VE7TMY had prepared the minutes from the last AGM and they were distributed in the SARC Communicator. Gord VA7GK moved that the minutes from the last AGM be approved. Seconded by Andrew VA7LGN. Carried

Presentation & Approval of 2022/2023 Financial Statements

Scott VE7HA presented a 2022 vs 2023 financial statement. Doug VA7JDJ moved to accept the financial statement as presented. Seconded by Eric Burr VA7EHB. Carried

Announcements

- Saturday Breakfast and OTC Open House. Saturday mornings 7:30am – 9:30am (or so) - Denny's at 68th and King George Blvd.
- OTC – 5756-142nd Street. Open from 10am to 12pm (or so) Saturdays
- Field Day – June 24-25th, 2023

Field Day will be located at the OTC this year - we can use assistance, before, during and after.

- Canada Day Contest July 1st, 2023 – at the OTC

Committee Reports

SEPAR (Gord VA7GK)

- Last Saturday's Emergency preparedness fair in Langley was a success, assisted by 10 volunteers.
- Trailer repairs, tidying up and interior reorganising have started.
- A plan is underway to combine SARC/SEPAR volunteers into a single list.

GOTA (Larry VE7LXB)

- We have many graduates from the ham class that are interested in gaining some practical experience with ham radio. The GOTA workshops are being well attended.

OTC (Gord VA7GK)

- Some maintenance has been performed on the furnace and plumbing recently

Membership (John VA7XB)

- 63 members out of 117 are currently in good standing, having paid dues for the 2023-24 fiscal year.

Contests (John VA7XB)

List of contests the group has participated in this year:

- RAC Winter and Canada Day Contests
- BC QSO Party
- ARRL International DX Contests
- CQ WW Contests
- CQ WPX Contests
- NA QSO Party
- Rookie Roundup
- VHF QSO Party
- CK7SAR callsign was used in a recent contest in honour of King Charles III coronation.
- Anyone that would like to be involved in contesting please contact John to be put on the notification list.

Nets (Reg VA7ZEB)

- Kapila is going to be absent on Tue June 27th. So there is an opportunity available if anyone is interested in net control, please contact Reg.
- Andrew has been assisting Rob as he hosts the net.

Elmer's Report (Kevin VE7ZD)

- We make it known to members and non-members that we can provide assistance with their radio problems.

Communicator (John VE7TI)

- The SARC Communicator is published via email to over 500 people. It is often picked up by QRZ.com and can sometimes increase the number of downloads.
- Jan-Feb 13500+ downloads. 145 unique countries have been noted downloading the newsletter.

Ham Class (and exams) (John VE7TI)

- There is still a high demand for the course and we are hosting students from various locations. Usually 50 per class but has been up to 75 at times.

CW Class

- First Tues on Sept 11th. Presented by Stan VA7NF in person at Surrey Fire Training Centre
- 13 on the list already. Contact John VA7XB to sign up.

Repeater Update/Status (Steve VE7SXM)

- No issues currently.

Website Update

Horace VA7HXB created a new website for SARC/SEPAR. Jeremy helped migrate to the

current hosting provider. SEPAR now also has .

Accomplishments this year

- Steve VE7SXM presented a series of images of events and activities during the year.

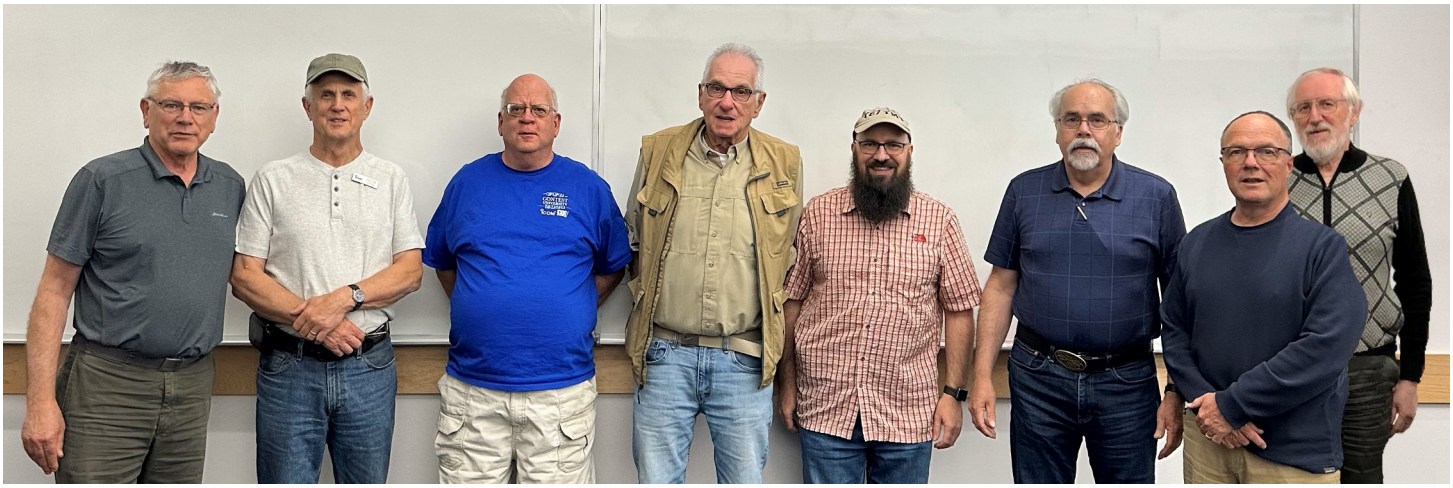
Election of Directors (John VE7TI)

- SARC has 8 directors with half elected each year for a 2 year term.
- Scott, Gord, Steve, and Kevin seats on the board are up for election. All except Kevin have agreed to run again. Positions of President, Vice President, Secretary, Treasurer are decided at the next director's meeting.
- Reg nominated Larry Bloom. Larry accepted.
- Doug nominated Steve McLean. Steve accepted.
- Steve nominated Gord Kirk. Gord accepted.
- Gord nominated Scott H. Scott accepted.
- After 3 calls for nominations from the floor none were received, and John VE7TI moved the 4 nominees be elected by acclamation. Seconded by Andrew VA7LGN. Motion carried.

AGM Adjournment

- AGM was concluded by Steve VE7SXM. Adrian VA7YEP moved that the AGM be adjourned, seconded by Doug VA7JDJ. Carried.
- Meeting adjourned at 8:17pm

~ Minutes prepared by Jeremy Morse VE7TMY



Your Surrey Amateur Radio Communications Society 2023-2024 Board of Directors

[Left to right] John Schouten VE7TI, John Brodie VA7XB, Scott Hawrelak VE7HA, Larry Bloom VE7LXB, Jeremy Morse VE7TMY, Steve McLean VE7SXM , Gord Kirk VA7GK and Stan Williams VA7NF.

General Meeting Minutes

SARC general meeting

June 14, 2023

Recording Secretary JEREMY MORSE VE7TMY

Attendees: 24
Start Time: 8:30pm after the AGM
Location: Surrey Fire Training Centre

Welcome and Call to Order (Steve VE7SXM)

Announcements

Projects and Kits (John VA7XB)

- Parts on order for Morse Tutor
- WSPR prototype has been made.
- Doug VA7JDJ and Ion VE7NL questioned the need for HF/advanced privileges to build and operate WSPR – to be further investigated.

Field Day Discussion (John VA7XB)

- Two (2) stations + GOTA + VHF planned
- Call for additional operators
- Pizza will be brought in for Friday setup crew. Saturday BBQ lunch hosted by Ralph & Nell. Chinese food takeout for dinner Saturday.
- Call for help on other specific tasks and bonus activities

GOTA Operation (Larry)

- VHF operators not yet designated.
- Steve volunteered to bring water and drinks.
- Anton volunteered to bring paper plates and cutlery.
- Sheldon volunteered to be a safety officer.
- John S volunteered to organize youth activity.

Canada day contest (John VA7XB)

- Friday June 30 5pm until Saturday 5pm.
- We will be using the RAC callsign of VE7RAC.

New Business

- Summer social meetings to be held 2nd Wed of July and Aug at the OTC.

Adjournment of the Business Meeting

- Richard VE7XU moved that the meeting be adjourned. Seconded by Reg VA7ZEB. Carried.
- Meeting adjourned at: 9:15pm

~ Minutes prepared by
Jeremy Morse VE7TMY

Reprint Policies

These are policies for reprints from The Communicator, a bi-monthly journal about amateur radio and other topics published by Surrey Amateur Radio Communications (SARC).

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We welcome your comments and feedback

Please consider leaving a comment via email to communicator@ve7sar.net, or on our blog site https://ve7sar.blogspot.ca or, better yet, contact our authors directly, so they know someone is out there reading our publication.

Social Reminder

The Saturday weekly social gathering is once again 'on' at the Denny's Restaurant, 6850 King George Blvd., Surrey BC from 07:30—09:30. All are invited. Afterwards, we will host workshops and will be available to invigilate Amateur Radio exams at the OTC, 5756—142 Street, Surrey from 10-noon.

Bring your ham issues, our Elmers will try to help you sort them out.

SARC News…

VE7FO is back on the air!

Congratulations to Steve Smith, the new VE7FO who passed with Honours after the Spring 2023 SARC Basic Amateur Radio course. Many of you will remember Steve's dad, SARC member Jim Smith VE7FO, who passed away late last year. As per ISED policy, Steve was able to inherit his dad's callsign and we are pleased it carries on in the Smith family.

Good luck Steve, you have a big legacy to live up to.

Our GOTA Workshops

We've now had three GOTA workshops and we already have reservations for the next one. It is paying of because new amateurs are being heard on the air.

Our sidewalk sale

Thanks to the generosity of Dan VE7BFY we recently offered a large quantity of equipment and accessories to our members and other hams. Dan had to downsize his residence and we wish him and Laurie all the best.

SEPAR

The Summer report

By GORD KIRK VA7GK

The lead up to field day is always a very busy time for the amateur community as SEPAR members can attest. We had several areas to look at in preparation for two events. Two weeks prior to field day SEPAR attended an Emergency Preparedness Fair along side the Langley Amateur Radio Association. This was a 4 hour event for the public to attend and see various booths promoting Neighborhood Preparedness, Earthquake Preparedness, First Aid, Water Storage and Filters, Food Storage, Cooking without Power, How to Build an Evacuation (bug out) Kit, Building a Documentation Binder, as well as discussing Fire Safety.

SEPAR was asked to present on Family and Neighborhood Emergency Communication plans. We had 10 volunteers show up to help with our set up and to demonstrate various equipment to the attendees. One part of our focus was to discuss with already licensed but inactive amateurs how to get on the air and help with understanding that a simple inexpensive handheld radio with the stock antenna may not meet their needs for communications if they have not tested it.

We had various member's grab and go kits, example antennas ranging from home build, to purchased Buddipole antennas. One of our members Larry (VE7LXB who runs the GOTA net) showed how to set up HF from the back of your car if you live in a townhome where larger antennas are not possible.

Our presentation session focussed on some of the areas we covered in previous issues of the Communicator, including how to get situational awareness, using phones and internet

Gord Kirk VA7GK is a SARC Director and the SEPAR Coordinator

The Langley EP Fair crew.

for planned communications moving to satellite texting devices like the Garmin inReach Mini, and of course amateur radio. Overall this was a successful and fun day despite the rain which came down most of the time.

These types of activity are always good to confirm our equipment is working. We have a small cargo trailer set up with three radio positions and there are always improvements and maintenance that can be done. One of our members (John VA7XB) is helping design a new cabinet to help store the folding tables and pop up canopies. He also helped with repositioning the chair storage to hangers on the rear door. He mounted a new box to the front tongue area of the trailer for miscellaneous equipment, helping to clear up some clutter. We also discovered what looked like an attempted break in to the rear doors and the part was repaired.

We also installed a 12 Volt Battery Box with battery to run the equipment inside. Previously it only ran from 110V through either shore or generator power.

With this equipment in place the next setup was our club's Field Day. The focus this year was to place the GOTA station in the trailer and have it running the entire time with newly licensed hams (or unlicensed visitors) under supervision. This helped the new people to spend some time in the trailer and see what was there and also get the support to try HF which most had not previously used. The biggest challenge of the day or Larry the GOTA coordinator was getting the operators to give up the radio to allow others to try. The end result was many newly licensed amateurs now excited to move into HF on top of being active on the VHF and UHF bands.

During field day we also set up our portable 100 foot tower and tested everything out on it. The HF antenna was assembled and the tower raised. Last year at field day we had identified work needing to be done on the trailer and over the year most was completed. This included new tires, brakes and an inspection to certify its safety under the BC Motor Vehicle Act. We also repaired our generator which failed last year, and we did some rewiring to allow the tower hydraulic system to work both from generator or shore power. The generator also had a 220V outlet installed to make it useful for move than tilting and raising the tower. From the 220V outlet an extension cord is available to split power to two 110 volt outlets for powering other items as required.

After a fabulous BBQ dinner during field day, I had a conversation that amateur radio is often seen as a solitary hobby. But with an active club it is far from a lonely time. We meet for breakfast/coffee weekly, have a weekly drop in, three nets during the week and a monthly meeting. In the summer the monthly meetings become an evening get together to visit in our lawn chairs and just have some food and fellowship. In reflecting on the conversation I was reminded that it also allows for some of our members to check in everyday on some of the nets just to keep connected with our friends. Becoming connected to a volunteer organization provides so many benefits to so many of our members.

As mentioned in our last article we will be continuing our look at communications plans. The last issue you were encouraged to write down the answers to four questions. This included who you wanted to talk to (don't forget work contacts), why, how you would do so and when. Also note this is being build to communicate with family and friends and many of these significant individuals in your life may not be amateur radio licensed.

With that information collected it is time to lay out a plan. So many individuals and groups are promoting the use of a PACE plan. This is an acronym which stands to Primary, Alternate, Contingency and Emergency plan.

In building your PACE plan, start with the first person you want to connect with in an emergency or communications outage and write out that persons name, phone number (work numbers too), email, what social media or communication platform (i.e. Telegram, Messenger, Instagram) you could use to reach them, Satellite phone number or if they have a satellite message device and what type of radio they may have. This may be other than a Ham radio, it may be FRS/GMRS, CB, commercial radio and don't forget marine radios. Last with the answer to the four questions and the list of information about each start creating your communications plan.

Primary: what do you normally use to communicate with that person, how often and when will you try. (e.g. do you call your spouse as you're leaving work and on the way home each day - note this is a predicable time).

Alternate: If the phone system (including regular text messaging) fails try an internet based messaging app.

Contingency: Send a text via a satellite messenger or now try on the prearranged radio frequency.

Emergency: This may be your out of town contact and or a prearranged meeting place.

The Primary and Alternate are easy to start with and the Contingency and Emergency plans may only be tried by the other if a regular communication window is missed or if a known emergency/disaster is happening (i.e. you just felt an earthquake).

Having situational awareness of coming weather or incidents (Wind storm, snow storm, wildfires or flooding) you can prearrange and remind others to be prepared to use the PACE Plan. With prearranged times and a plan written out for each person you want to contact. You may find that most of you will use the same method to contact others, and that it will be very easy (think group text or chat). Others may only be contacted with a specific plan for them. In all cases both parties will need to have a copy of the plan and have tested all of the component systems you choose to use.

I hope this helps with your building an initial communication plan. In the next issue we will look at communications in our neighborhood.

Until next time, enjoy your summer and get on the air!

~ *Gord VA7GK*

Name	Frequency	Offset	CTCSS
VE7RSC (Primary Repeater)	147.360	+0.600	110.9
VE7RSC (Secondary Repeater)	443.775	+5.0	110.9
VE7RPT (Primary Regional Repeater)	146.940	-0.600	Optional 136.5 Rcve
Simplex 1	(VHF) 146.550		
Simplex 2	(VHF) 147.420		
Simplex 3	(UHF) 446.550		
Simplex 4	(UHF) 447.425		

Other frequencies in the Greater Vancouver area:

Primary: Coquitlam/Abbotsford 146.430

Primary: Inter-Municipal Group 3 146.445

Primary: Vancouver; Mission; Sec. Coquitlam 146.460

Primary: Kent-Mission; Sec. Richmond 146.475

Primary: Inter-Municipal Group 2 146.490

Primary: New West; Sec. Richmond 146.505

National Calling / FM Simplex Group I 146.520

Primary: North Shore; Port Coquitlam 146.535

Primary: Bowen Island; Surrey 146.550

Intermunicipal Group 1 Coordination 146.565

Primary: Lions Bay/Vancouver/Delta/Langley 146.580

Primary: Port Moody; Sec: Burnaby 146.595

Secondary: Vancouver/Surrey 147.420

Secondary: Vancouver (UBC) / Maple Ridge 147.450

Primary: White Rock/Chilliwack; Sec. No. Shore 147.480

Secondary: Burnaby/Pitt Meadows 147.510

Primary: Delta; Sec: Abbottsford 147.540

Primary: Hope; Sec: Delta; ALSO EMBC 147.570

Surrey Emergency Program Amateur Radio

HAM LEFTOVERS...

Radio Apocalypse: Hardening AM radio against disasters

If you've been car shopping lately, or even if you've just been paying attention to the news, you'll probably be at least somewhat familiar with the kerfuffle over AM radio. The idea is that in these days of podcasts and streaming music, plain-old amplitude modulated radio is becoming increasingly irrelevant as a medium of mass communication, to the point that automakers are dropping support for it from their infotainment systems.

https://hackaday.com/2023/06/06/radio-apocalypse-hardening-am-radio-against-disasters/

FreeDATA

Introducing FreeDATA - the innovative new software development for ham radio operators! This new software is worth checking into if you want to send text and data files seamlessly across ham radio networks.: https://youtu.be/xOSe8S_0g34

Quick and easy turnstile satellite antenna

The number of satellites whizzing by over our heads at any moment is staggering, and growing at a rapid rate as new constellations are launched. But sometimes it's the old birds that are the most interesting, as is the case with some obsolete but still functional military communications satellites, which thanks to a lack of forethought are largely unsecured and easily exploitable. And all that's needed to snoop in on them is a cheap ham radio and something like this simple and portable satcom antenna.

This is wild! Blowing up capacitors at 187,000 FPS

Gav and Dan, the Slow Mo Guys overload some capacitors and film the explosive results at 187,500fps. That's 7500 times slower than you can see with your own eyeballs. Filmed at 80,000fps and 187,000fps with the Phantom TMX 7510: https://youtu.be/6WUxgmMDts4

Super Basic Direct Conversion for 40M CW

Here is a receiver built from this same circuit years ago. It is about as simple as you can get and still receive decent CW on either the 80M or 40M bands. If SW AM stations bleed in then using T50-2 toroids for the coils increases the Q and helps a lot. YouTube video: https://youtu.be/v5Le7gUtWOI

The circuit is from the following site: https://www.qsl.net/kc6wdk/

We're QRT

Reaching for the Stars:

The triumph of teamwork in Amateur Radio and a fairy tale that almost rings true

By JOHN SCHOUTEN VE7TI

John Schouten VE7TI is a Director with Surrey Amateur Radio Communications

I asked ChatGPT (artificial intelligence) to write a column about our GOTA team's Field Day accomplishment. Given a few details and names, this is what it came up with…

Once upon a time, in the town of Surrey, a group of passionate individuals, amateur radio operators, all newly certified, and led by a new ham named Larry, came together to form a Field Day "Get On The Air" team. Bound by their shared love for radio communication and a burning desire to challenge themselves, they set their sights on the ARRL Field Day contest—a prestigious event that tested their skills, endurance, and, above all, their ability to work as a team.

For months leading up to the contest, the members of "Get On The Air" dedicated themselves to intense study sessions. They tirelessly honed their technical skills, studying the intricacies of antenna designs, frequency manipulation, and signal propagation. They meticulously planned every aspect of their setup, from equipment selection to power supply arrangements, leaving no room for chance.

The team comprised individuals with diverse backgrounds and expertise. Dale, an electrical engineer, brought his technical prowess and analytical thinking to the group. Lesley, a housewife and contest participant, offered her invaluable knowledge and experience. Manvir, the youngest of the bunch, impressed everyone with his insatiable curiosity and natural talent for deciphering complex wave patterns. Together, they formed a formidable unit, each member bringing something unique to the table.

As the day of the contest dawned, the team rose with a renewed sense of purpose. They arrived at the contest site, a sprawling field enveloped by nature's embrace, well before sunrise. With

unwavering determination, they erected towering antennas and meticulously connected an array of transceivers. Each wire was strategically positioned to ensure optimal coverage, and every cable connection was double-checked for precision.

Once the setup was complete, the team took a moment to soak in the beauty of their creation—a testament to their dedication and hard work. Then, as the clock ticked, they started tuning their radios, eagerly anticipating the start of the contest.

For the next twenty-four hours, the "Get On The Air" team operated with unwavering commitment. Their dedication was unmatched as they tirelessly relayed signals, navigated through complex band conditions, and contended with unpredictable atmospheric interferences. They supported one another, offering encouragement and technical advice, even during the most challenging moments.

The hours blurred together, but the team pressed on, fueled by their shared passion and an unrelenting desire to achieve greatness. They adapted to changing conditions, altered their strategies, and persevered through sleepless nights. In those moments, they learned that true teamwork was not only about individual excellence but about synchronizing their efforts and trusting one another.

Finally, the clock struck the end of the contest. Fatigued but elated, the team gathered around their equipment, ready to assess the results of their collective endeavor. As they tallied their score, a sense of anticipation filled the air. When the final numbers were revealed, their hearts skipped a beat—they had achieved a record-breaking score in the GOTA category of the ARRL Field Day contest!

Joy erupted within the team, tears of happiness streaming down their faces. Their achievement wasn't just about the numbers in the log; it was a testament to their unwavering teamwork, dedication, and commitment to their shared passion. They had pushed their limits, overcome obstacles, and emerged victorious as a united front.

News of their triumph spread throughout the amateur radio community, inspiring others to chase their dreams, test their limits, and find strength in collaboration. The "Get On The Air" team became a symbol of what could be achieved when passion, teamwork, dedication, and commitment converged.

In the years that followed, the team continued to participate in contests, breaking records and nurturing new talents along the way. Their story became a legend in the annals of amateur radio, a tale whispered in hushed tones.

If not for the few fantasy elements that ChatGPT added, this does describe the hours of study, commitment, and perseverance that this team of new hams brought to Surrey Amateur Radio Communications and the Surrey Emergency program Amateur Radio.

The other Directors, and particularly their course instructors, are immensely proud of them and their accomplishment!

73,

~ John VE7TI
SARC Course Coordinator

SARC SOCIETY DIRECTORS 2022-2023

PRESIDENT
Steve Mclean VE7SXM
president at ve7sar.net

VICE PRESIDENT
John Brodie VA7XB
vicepresident at ve7sar.net

SECRETARY / WEBMASTER
Jeremy Morse VE7TMY
secretary at ve7sar.net

TREASURER
Scott Hawrelak VE7HA
treasurer at ve7sar.net

DIRECTORS

Gord Kirk VE7GK
(SEPAR Liaison)
SEPAR @ ve7sar.net

Larry Bloom VE7LXB
New Ham Coordinator
GOTA @ ve7sar.net

John Schouten VE7TI
(SARC Publications/Blog/Social Media & Courses)
communicator at ve7sar.net
course at ve7sar.net

Stan Williams VA7NF

SARC MEMBERSHIP & CONTEST MANAGER
John Brodie VA7XB
membership at ve7sar.net

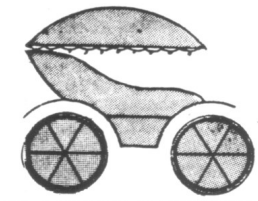
SARC QSL MANAGER
(pro tem) John Brodie VA7XB

SARC REPEATER MANAGER
Horace Bong VA7XHB
repeater at ve7sar.net

SARC NET MANAGER
Reg Natarajan VA7ZEB
net at ve7sar.net

A look back...

From The Communicator—August 1983



SURREY AMATEUR RADIO CLUB
COMMUNICATOR
(VE7SAR)
P.O. Box 542, Surrey, B.C. V4T 5B7

Volume No. 7 | August 1983 | Issue No. 6

Mike VE7CLE — Carey VE7CFC

FIELD DAY 1983

Field Day 1983 VE7SAR style was as in past years, a resounding first class event which ran like a well oiled machine.

In addition to the die hard old (as in Surrey ARC Field Days Hams) we did have some new operating blood to mention one in particular Ken Clarke. Ken held the fort for the 80 meters C.W. slot for many hours. A most commendable effort considering the very short time he has had his Ham ticket. Good show Ken, hope to see you next year.

While we are on the subject of mentioning Field Day people the author of this "blurb" can always be assured that Alvin VE7CDC will have a new twist to "colour your Field Day". This year was no exception.

The diary of events went something like this:

Two weekends prior to Field Day a group of field day regulars, i.e. Jim VE7 CSJ, Fred VE7CJG and of course Alvin trucked up the mountain road with the intentions of removing a tree stump that had blocked the road from a winter storm. On reaching the base of the hill we were confronted by a log skidder coming down the hill. As Alvin was driving the lead truck he did the asking of what was the skidder doing on OUR road, especially two Field Day!! We learned some good news and some bad news. The operator had pushed the tree stump off to the side of the road. The bad news was he had knocked down the two commercial antenna wood poles which we use to support our 75/40 Mtr dipoles. He (the operator) had been authorized by the site user i.e. Dept. of Lands and Forests to remove the poles.

On reaching the site we discovered one of the poles (the longest) laying in the grass just below the hill top.

After completing what we originally set out to do, i.e. clean off the site area of the

continued on back page

Past Communicators are available at:
https://ve7sar.blogspot.com/search/label/SARC%20Communicator
or search the complete Communicator contents & index at:
bit.ly/SARCindex

CQ summer

July & August

Getting ready for a new amateur radio season starting in September with some great guest presenters. But we're not sitting still during the summer. We have a couple of contests and two social gatherings replacing our regular monthly general meetings, outdoors if the weather permits. Both members and non-members are invited 7-9PM, Wednesday, July 12 and August 9. We will have some beverages available for you and you are invited to bring a dish or some baking to share.

Our next general meeting is on Wednesday, September 13th. Watch your email for details on the location and presenter.

Stay cool and have a great summer!

SARC hosts an Amateur Radio net each Tuesday evening at 8 PM. Please tune in to the VE7RSC repeater at 147.360 MHz (+600 KHz) Tone=110.9, also accessible on IRLP node 1736 and Echolink node 496228.

On UHF we operate a repeater on 443.775MHz (+5Mhz) Tone=110.9 or IRLP Node 1737.

*We have a '**Get On The Air**' net directed at new hams on Thursday evenings at 8pm, on our 2m repeaters: North: 147.360MHz+ Tone=110.9Hz and South: 147.360MHz+ Tone=103.5Hz. Our SARC Elmers will be on hand to answer your questions.*

	SARC Net 20:00 Hrs
1st Tuesday **Standby**	Gary VA7GPR Reg VA7ZEB
2nd Tuesday **Standby**	Andrew VA7LGN Sheldon VA7XNL
3rd Tuesday **Standby**	Rob VE7CZV REG VA7ZEB
4th Tuesday **Standby**	Kapila VE7KGK John VA7XB
5th Tuesday **Standby**	Reg VA7ZEB John VE7TI
Want a turn at Net Control? Contact the SARC Net Manager	

Down The Log…

SARC Monthly Meetings

2nd Wed. (Sept-Jun) 1900 hrs at the Surrey Fire Service Training Centre, 14923 - 64 Avenue, Surrey, BC. Here is a what3words link and map: https://what3words.com/markers.addiction.ozone

Weekly SARC Social

Saturday between 0730 and 0930 hrs at the Denny's Restaurant, 6850 King George Blvd., Surrey BC

Workshops

Saturday between 1000 and Noon at the OTC 5756 142 Street, Surrey

SEPAR Net

Tuesday at 1930 hrs local on 147.360 MHz (+) Tone=110.9

SARC Net

Tuesday at 2000 hrs local on 147.360 MHz (+) Tone=110.9

VE7RSC Repeaters

2m North: 147.360MHz+ Tone=110.9Hz
IRLP node 1736
Echolink node 496228

2m South: 147.360MHz+ Tone=103.5Hz Fusion capable; No IRLP/EchoLink

1.2m: 223.960 Mhz -1.6 Tone=110.9Hz

70cm: 443.775MHz+ Tone= 110.9Hz
IRLP node 1737
WiRES-X Room ID 00047

We Have A SARC Patch!

These are suitable for sewing on a jacket, cap or your jammies, so you can proudly display your support for the club.

The price is $4 each or three for $10 and they can be picked up at a meeting or the weekly Koffee

We thank

ICOM

for their support

We thank our sponsors for their SARC support.

Please support them.

Your SARC Membership

If you have not already renewed, your membership in SARC expired on May 31st.

You are requested to renew your membership as soon as possible. Those not renewed will be removed from the roll in September.

Payment may be made in one of several ways:

1. Use PayPal on the SARC website: www.ve7sar.net
2. If we meet, bring a cheque or cash to the AGM
3. Mail a cheque to our Treasurer Scott Hawrelak 13935 80A Avenue, Surrey V3W 6P5

Dues are as follows:

- Individual $31
- Individual (if RAC member) $26
- Family $41
- Family (if RAC member) $36

Thankyou for taking care of this as soon as possible.

~ John Brodie VA7XB
Membership